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AN ECONOMIC STUDY OF POTATO PRODUCTION IN NEW BRUNSWICK

I. S. McARTHUR

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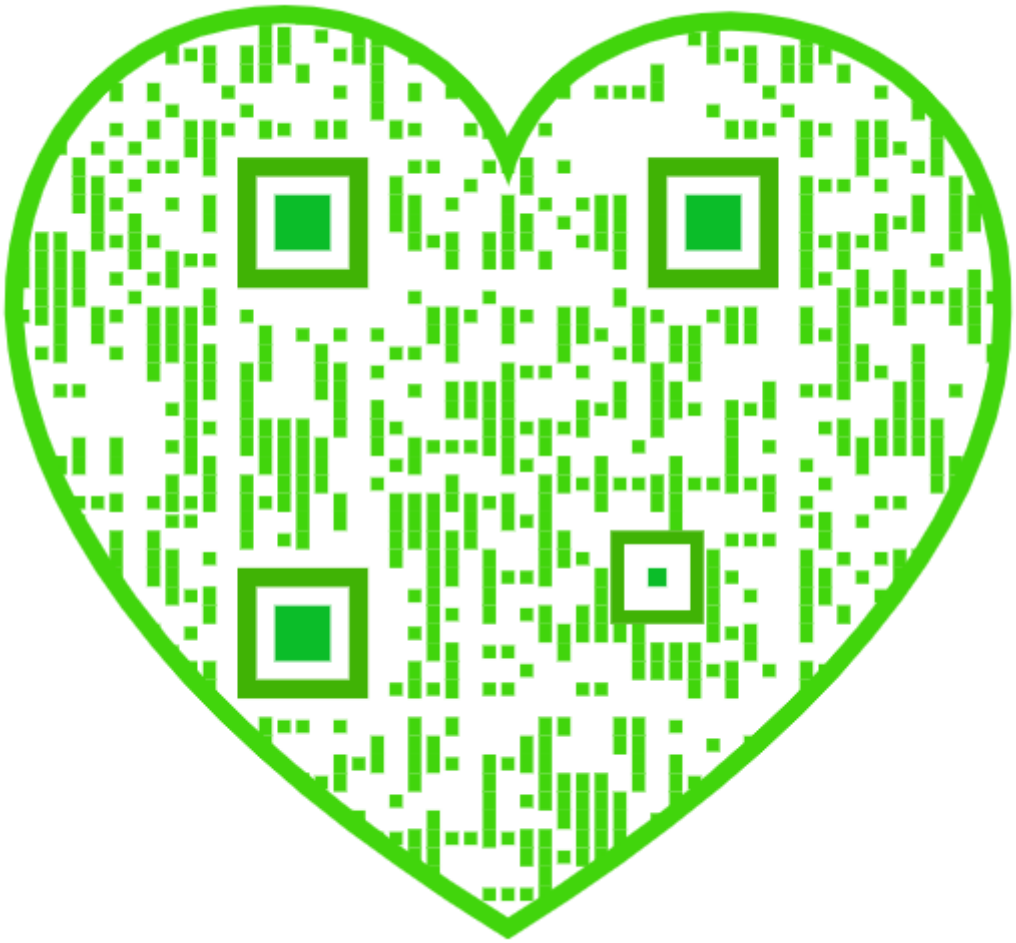

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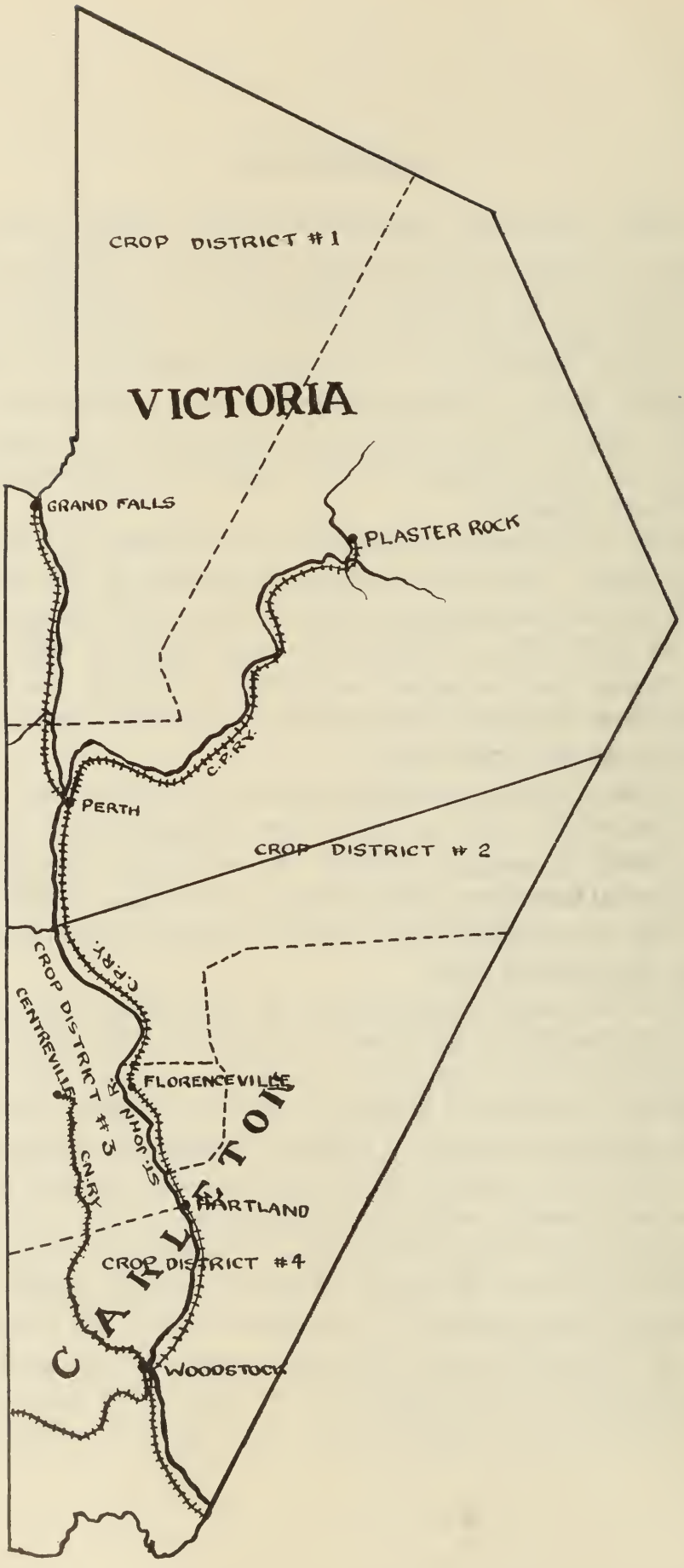
FOREWORD

Early in 1935 a National Committee on Potato Research was organized to study all phases of potato production and marketing in Eastern Canada. The Economics Branch of the Dominion Department of Agriculture undertook to make a study of the production methods and costs of production in the Upper St. John Valley of New Brunswick. The study took the form of a comprehensive farm management survey. The Economics Branch provided the personnel of the field party, with the New Brunswick Department providing half of the transportation, and the assistance of the Agricultural Representative for the area in an advisory capacity.

The counties of Carleton and Victoria were selected for the purposes of the production study. These two counties are located in the west-central section of New Brunswick, bordering the state of Maine and constituting the valley of the Upper St. John River. During July and August of 1935 a total of 202 farm survey records were collected and taken to Ottawa for tabulation and analysis. The New Brunswick Department co-operated further by providing clerical assistance for the office work.

In view of the abnormal marketing situation which existed in 1934-35, it was felt that the study could be made more valuable by its continuance, at least in part, during the summer of 1936. By means of a written questionnaire and further personal interviews with farmers in the area, a total of 70 records covering the crop year 1935-36 were secured from the same farmers who had co-operated in the previous year.

The study of this potato-growing area in New Brunswick was designed to bring out the relationship of the potato enterprise to the balance of the farm business as organized, and to determine as nearly as possible, the costs involved in the production of an acre of potatoes. Mr. S. C. Hudson was in charge of the field party during the summer of 1935 and assisted in planning the analyses of the data. The survey record provided for a detailed analysis of the entire farm business with special emphasis being placed on the potato crop. The farmers of the area gave freely of their time in assisting in the collection of the basic data and to them the Economics Branch is deeply indebted. Officers of the New Brunswick Department of Agriculture and of the Dominion Experimental Farm at Fredericton were frequently consulted and gave much useful assistance and guidance in the course of the study. To them and all others who assisted in making this report possible, the writer is indebted.



Carleton and Victoria Counties, New Brunswick. The area included in this study has been divided into four crop districts based on variations in farming practices.

AN ECONOMIC STUDY OF POTATO PRODUCTION IN NEW BRUNSWICK

BY

I. S. McArthur, M.Sc.

INTRODUCTION

In the province of New Brunswick the primary industries of agriculture, fishing and lumbering have always been predominant. A brief review of the early history of the province is presented in the Census of Agriculture for New Brunswick for the year 1931. The statement reads in part as follows: "Only very few statements regarding the early developments of New Brunswick are available previous to its organization into a province. In the year 1695 there were in New Brunswick 49 persons and 166 'arpents' under cultivation; the agricultural production consisted of 130 bushels of wheat, 370 bushels of corn, 30 bushels of oats, 170 bushels of peas, and 3 bushels of beans. The colonists owned at that time, 38 horned cattle, 116 swine and 362 heads of poultry.

'It cannot be claimed that the portion of Nova Scotia now known as New Brunswick made much of a figure in history in the years that preceded the American Revolution. Still the settlements were slowly and steadily growing.'[1]

In 1824, the population of New Brunswick had reached 74,176. Unfortunately there is no statement of agriculture to be found, even though it is known that by that time agriculture had acquired a considerable degree of importance. 'Agriculture was from the first the chief occupation of the people. The farmers grew wheat in considerable quantities, most of it winter wheat. Rye was grown in large quantities and potatoes were always an abundant crop.' "[2]

The agricultural development of the province, by census years since 1861 is presented in Table 1. It will be noted that the growth in population since 1861 has been chiefly in the urban sections, rather than the rural. The number of persons occupied in agriculture has been declining since 1881, with a peak of 54,585 persons in that year. However, on a percentage basis, the population of New Brunswick still remains predominantly rural. The area of occupied farm land in 1931 was only 38·7 per cent of the total possible farm land. A large portion of the remainder of the possible farm land is still under forest.

[1] W. O. Raymond, Canada and its Provinces, Vol. 13, p. 127.
[2] Census of Canada, 1931, p. x.

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TABLE 1.—POPULATION, FARM HOLDINGS AND AREAS, NEW BRUNSWICK, 1861-1931*

Item	Unit	1861	1871	1881	1891	1901	1911	1921	1931
opulation	No.	252,047	285,594	321,233	321,263	331,120	351,889	387,876	408,219
Urban	No.	–	50,213	59,092	48,901	77,285	99,547	124,444	128,940
Rural	No.	–	235,381	262,141	272,362	253,835	252,342	263,432	279,279
Per cent rural	p.c.	–	82·4	81·6	84·8	76·7	71·7	67·9	68·4
Area of possible farm land	ac.	–	–	–	–	–	10,718,000	10,718,000	10,718,000
Number of occupied farms	No.	24,115	31,202	36,837	40,836†	37,006	37,755	36,655	34,025
Area of occupied farms	ac.	3,787,524	3,827,731	3,809,621	4,471,250	4,443,400	4,537,999	4,269,560	4,151,596
Per cent of possible farm land	p.c.	–	–	–	–	–	42·3	39·8	38·7
Area improved	ac.	885,108	1,171,157	1,253,299	1,509,790	1,409,720	1,444,567	1,368,023	1,330,232
Per cent of possible farm land	p.c.	–	–	–	–	–	13·5	12·8	12·4
Per cent of area occupied	p.c.	23·4	30·6	32·9	33·8	31·7	31·8	32·0	32·0
Average acreage per farm	ac.	157·1	122·7	103·4	109·5	120·1	120·2	116·5	122·0
Average acreage of improved land per farm	ac.	36·7	37·5	34·0	37·0	38·1	38·3	37·3	39·1
Number occupied in agriculture	No.	35,001	40,394	54,585	51,194	49,469	45,741	46,982	46,274
Acres of land per person occupied in agriculture	ac.	108·2	94·8	69·8	87·3	89·8	99·2	90·9	89·6
Acres of improved land per person occupied in agriculture	ac.	25·3	29·0	23·0	29·5	28·5	31·6	29·1	28·7

* Census of Canada, New Brunswick, 1931, p. XII.
† Includes plots of less than 1 acre.

Soils.—The soils of the area included in the study have not yet been studied in detail by soil analysts, although some sampling has been done by officials of the New Brunswick Department of Agriculture. A noticeable deficiency in magnesium has been detected in some areas and research is being carried on in connection with this problem. The soil in general may be classed as a gravel loam, with a decided tendency to be stony. Wide variations in the type and fertility of the soil was reported on individual farms. The topography of the land is rolling and the highlands are inclined to be acid in reaction.

Climate.—The climate of New Brunswick is not as extreme as that of some parts of Western and Central Canada. However, the winters are long and cold, while moderate temperatures prevail during the summers. The coldest month of winter in the area studied had a mean temperature of 9° F., while the summer temperature seldom exceeds 85° F. The average precipitation is between 40 and 45 inches. Snow fall is heavy in northern New Brunswick, often exceeding 100 inches. Precipitation and temperature readings at the Dominion Experimental Farm, Fredericton, New Brunswick, for the summer months of 1934, compared with the long-time normals are shown in Table 2.

TABLE 2.—PRECIPITATION AND MEAN TEMPERATURES, EXPERIMENTAL FARM, FREDERICTON, NEW BRUNSWICK, MAY TO OCTOBER, 1934*

——	May	June	July	Aug.	Sept.	Oct.
Total precipitation, (1934)	1·51	6·39	2·54	2·99	1·58	3·38
Difference from normal precipitation	−0·83	+3·23	−0·65	−0·70	−1·45	−0·27
Mean temperature, (1934)	53	59	66	62	61	43
Difference from normal temperature	+3	−1	−1	−2	+5	−3

* Data supplied by the Meteorological Service of Canada.

Climatic conditions for the summer of 1934 were particularly suited to potato production. Rainfall was above normal in June, but below normal for the balance of the season. The temperature was slightly below normal for the growing months of June, July and August.

Population.—The population of Carleton county as shown by the decennial census reached a peak in 1881 and shows a slight decline for each of the succeeding decades. Victoria county on the other hand has been recording a steady increase in population since 1871. Large areas of this county are gradually being brought into agricultural production. The total population of the two counties has been growing, in spite of the steady decline in Carleton.

TABLE 3.—POPULATION, CARLETON AND VICTORIA COUNTIES, NEW BRUNSWICK, 1871-1931*

—	1871	1881	1891	1901	1911	1921	1931
Carleton—							
Urban	2,282	2,487	3,288	3,644	3,856	4,209	4,166
Rural	17,656	20,878	19,241	17,977	17,590	16,891	16,630
Total	19,938	23,365	22,529	21,621	21,446	21,110	20,796
Victoria—							
Urban	–	–	530	644	1,280	1,327	1,556
Rural	4,407	7,010	7,175	8,181	10,264	11,473	13,351
Total	4,407	7,010	7,705	8,825	11,544	12,800	14,907

* Census of Canada, 1871-1931.

The principal trading centre of the area is the town of Woodstock in Carleton county. Located in the southern section of the county on the St. John river, this town was originally an important lumbering centre with several mills and foundries. The population in 1931 was 3,259 persons; a decline of 121 from that of 1921. Present activity is confined chiefly to providing facilities for the surrounding agricultural community.

Two small lumber mills were in operation in 1935, working part time only. A wood working factory was operated for ten months of the year, employing from ten to fifteen men. The annual turnover was estimated at approximately $30,000; about one-half of this business was transacted with local farmers.

A woollen mill, handling around eight tons of wool per year was also in operation for ten months of the year. All manufacturing carried on at this mill is custom work for farmers. There is at present only one foundry in operation, employing about twelve men for the entire year. This plant manufactures sawmill equipment, which is shipped to other parts of Canada in most cases.

The community is served by a local branch creamery, having about 500 patrons. The 1934 dairy business of this branch creamery amounted to approximately $25,000, including sales of butter and ice cream.

Hartland is located approximately nine miles north of Woodstock on the St. John river. This town reported a population of 907 in 1931. The chief industry of the town is potato starch manufacturing. A total of 201,000 barrels of potatoes were processed in 1934-35. The factory employs from twenty to thirty men during the winter season, but does not operate every year.

Perth, further north, on the St. John river and at the southern end of Victoria county is chiefly a distributing centre, with one sawmill operating part time only.

The lumbering area on the Tobique river, 25 miles east of Perth is served by the village of Plaster Rock. At this point one large lumber mill operates about four months of the year, providing work during this period and for an additional four months in the bush, for about one hundred men.

Farm Facilities.—A number of interesting items concerning the facilities available on New Brunswick farms are recorded in the Census of Canada, 1931. There were 4,007 farms in Victoria and Carleton counties at that time. Telephones were reported by 1,517 of these farmers. Radios were found in 394 homes, and electric light or gas had been installed in 236, and a total of 490 farmers reported running water in the home.

The majority of the farms were located within five miles of the nearest railway station, 2,566 being located within this radius. In the group from five to nine miles from the station, there were 1,142 farms. The remainder were located over ten miles distant.

Roads in the area were chiefly gravel and were well kept. There were 2,994 miles of gravel road in 1931. Hard surface macadam road amounted to 99 miles. In addition, there were 528 miles of improved dirt road and 304 miles of unimproved country road.

Municipal Organization.—The county of Carleton comprises eleven parishes and two towns. The county is the smallest unit of government. The Carleton county council has twenty-seven members representing the parishes and towns. The council is presided over by a warden elected for two years. Votes of money for each parish are recommended by one of the councillors representing that parish and considered by the council as a whole. Taxes are now collected by two county collectors. This is a change from the previous system when there were several collectors for each parish. These men receive 5 per cent on collections made. Tax delinquency increased from 1929 to 1932, but declined somewhat during the succeeding three years. Assessments are made by a board of three assessors who keep a tax roll of previous years and make the necessary adjustments to it. Ratepayers are required to file a statement of assets, otherwise the assessors estimate their value. The assesors valuation is divided by two and the assessment set at two-thirds of this result.

The county had one hundred and thirty-seven active school districts in 1935, each administered by three trustees. One school inspector is appointed for the county. Once a year the ratepayers meet and vote money for the operation of the school for the following year.

All persons betwen 21 and 60 years of age are subject to a poll tax of $2 per person. Road taxes are fixed by provincial statute at 40 cents per $100 of assessment. Ratepayers have the option of working out the road tax by statute labour.

Municipal organization in Victoria county is essentially the same as that of Carleton. There are six parishes and one town in this county and the council consists of fourteen members. Two councillors are elected from each parish every four years. In the case of the town of Grand Falls, one councillor is elected and one appointed by the town council. The warden is elected for one year. Money votes for each parish are recommended by the councillor representing the particular parish and considered by the council as a whole.

Tax collections are made by two collectors for the county. The collectors have the power to force payment, but this power is seldom used. Assessments are made in a similar manner to those of Carleton county. Tax delinquency remained fairly constant over the period 1931 to 1935, with a slight reduction in the latter year. School and road taxation is handled in a similar manner to that of Carleton county.

The county pays a grant to the schools based on a rate of 60 cents per person, as shown in the last preceding census. This grant is allocated by the provincial Department of Education, on the basis of attendance at schools. The provincial government also pays a grant direct to the teachers, based on their training. Road taxes not worked out by statute labour are collected by the counties and transferred to the Provincial Treasurer.

Forest Products.—The sale of forest products provides a substantial source of revenue to farmers in Carleton and Victoria counties. In addition, the available supply of firewood and lumber for farm use is a means of reducing farm costs. The data prepared by the Census of Canada, 1931, throws some light on the importance of forest products.

The sale of firewood, pulp, and logs, not only provides cash revenue during the winter months, but also provides a method of utilizing labour more fully during the slack season. In addition to the sale of these products there were also a few railway ties, telegraph poles, and miscellaneous products of the forest sold.

TABLE 4.—FOREST PRODUCTS SOLD AND USED ON FARMS, CARLETON AND VICTORIA COUNTIES, NEW BRUNSWICK, CENSUS OF CANADA, 1931

—	Average—all farms	Average—farms reporting item
	$	$
Sales—		
Firewood	33	47
Railway ties	1	1
Telegraph poles	2	2
Pulp	12	18
Logs	8	12
Other	–	1
Total sales	56	81
Used on farms	65	93
Total value	121	174

The People.—The total population of Carleton and Victoria counties in 1931 was 35,703. The majority of these people were of British origin, over 80 per cent being classified under this heading. The remainder were chiefly of central European stock. In Victoria there were approximately 4,600 French-Canadians, and one settlement of Danish farmers with a population of about 900. Carleton county was settled approximately one hundred years ago, while in Victoria new farms are still being developed.

TABLE 5.—RACIAL ORIGIN OF POPULATION, CARLETON AND VICTORIA COUNTIES, NEW BRUNSWICK*

—	Carleton	Victoria	Combined total	Percentage of total
Total population	20,796	14,907	35,703	100·0
British	19,868	8,905	28,773	80·6
French	233	4,582	4,815	13·5
Danish	50	829	879	2·5
Other European	460	316	776	2·2
Other	185	275	460	1·2

* Census of Canada, 1931.

The farmers visited in the study were mainly of British descent, with the exception of some French and Danish farmers in Victoria county. These farmers had owned their farms for an average of twenty years, and in many cases the farms had been in the family for a much longer period. The average age of the operators was 47·6 years. Most of these men had public school education, while a number had also attended high schools, business colleges, or other educational institutions.

The average number of people living in the farm home was six, made up of an average of 3·6 adults and 2·4 children. Children over 16 years of age were considered as adults for the purposes of this study. In many cases one or more of the operators' sons were working the farm jointly with their fathers.

TABLE 6.—YEARS OF OWNERSHIP, OPERATORS' AGE, AND FARM FAMILIES ON 199 FARMS STUDIED

Item	Average, all farms
	years
Years of ownership	20·0
Age of operators	47·6
Number of adults	3·6
Number of children	2·4

Economic Conditions in 1934 and 1935.—While some signs of recovery from the low levels of the depression were evidenced in Canada during 1934, the prices of agricultural products were still far below the levels of 1926. Export markets were restricted and domestic markets were unable to absorb the balance of most Canadian farm products at remunerative prices to the producers.

The index of prices of Canadian farm products for the year 1934 averaged 59·0 in terms of 1926, compared with the index of all commodities at 71·6[3]. Prices of animal products had recovered somewhat more than those of field crops. The index of prices for animal products averaged 67·6 for 1934, while the index of field crops averaged 63·9. A slightly upward trend was noticeable in these indexes during 1934.

Economic conditions improved materially in Canada during 1935, especially in the case of prices of agricultural products. The index of prices of Canadian farm products averaged 63·4 in 1935 compared with the index 59·0 for 1934. The increase was evidenced both in the case of field crops and animal products. In the case of potatoes, the price improvement in 1935 was such that the general feeling in the area studied was much improved over that of the previous year.

POTATO PRODUCTION IN CANADA

Potatoes are produced in all provinces of Canada. The greater part of the acreage devoted to potatoes is in the five eastern provinces, where over 75 per cent of the crop has been produced during the past ten years. The Canadian production of potatoes in 1935 totalled 38·7 million hundredweight, a reduction of 9·3 million hundredweight from that of 1934. Acreage was reduced by 62,000 acres and yield per acre was 76·2 hundredweight in 1935 compared with 84·5 hundredweight per acre in 1934. The 1934 Canadian crop of 48 million hundredweight was 12·5 per cent above the crop of 1933. In the three Maritime Provinces the 1934 production was 29 per cent above that of the previous year.

In the province of New Brunswick, especially in Carleton and Victoria counties, the production of potatoes is one of the most important features of the farm business. The census figures for 1931 show that 85·4 per cent of the farms in New Brunswick reported the cultivation of potatoes in that year.

Ontario and Quebec are the most important provinces from the standpoint of acreage and production of potatoes. The large local markets of these provinces tend to keep farm prices of potatoes at a higher level than in the Maritimes, especially in years of surplus production.

[3] Dominion Bureau of Statistics. Prices and Price Indexes.

TABLE 7.—ACREAGE OF POTATOES IN CANADA AND THE FIVE EASTERN PROVINCES, 1926-1935*

Year	Canada	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario
	acres	acres	acres	acres	acres	acres
1926	523,112	34,891	29,452	42,744	159,000	153,468
1927	572,373	48,800	31,628	46,998	162,000	159,871
1928	599,063	51,800	30,685	52,239	164,000	181,241
1929	543,727	42,500	30,783	45,215	162,411	148,435
1930	571,300	45,700	31,200	48,000	165,800	159,000
1931	583,926	53,815	22,664	60,260	146,190	171,175
1932	521,500	37,500	20,600	48,200	132,500	156,000
1933	527,700	37,600	20,500	46,900	133,100	157,500
1934	569,200	40,100	21,900	54,200	143,400	164,300
1935	506,800	33,100	20,600	44,300	127,900	149,200
Ten-year average	551,870	42,590	26,001	48,906	149,630	160,019

* Data supplied by the Dominion Bureau of Statistics.

The acreage seeded to potatoes in Canada, while subject to considerable variation from year to year, does not show any definite trend over the past ten years.

Production figures fail to indicate any marked tendency to change over the past ten years. Quebec reports the largest production of potatoes, followed closely by Ontario. New Brunswick leads the Maritime Provinces in both acreage and production.

TABLE 8.—PRODUCTION OF POTATOES IN CANADA AND THE FIVE EASTERN PROVINCES, 1926-1935*

Year	Canada	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario
	000 cwt.	000 cwt.	000 cwt.	000 cwt.	000 cwt.	000 cwt.
1926	46,937	4,603	3,115	6,070	14,676	9,898
1927	46,458	4,418	2,680	4,204	14,175	9,297
1928	50,195	5,708	3,280	6,776	13,071	11,875
1929	39,930	3,820	2,872	4,646	15,429	8,484
1930	48,241	4,799	3,338	5,853	13,491	10,965
1931	52,305	4,884	1,946	6,341	16,897	12,042
1932	39,416	3,188	2,122	3,856	11,475	9,516
1933	42,745	3,760	1,866	5,394	13,444	10,112
1934	48,095	4,824	2,453	6,938	14,244	11,435
1935	38,670	3,045	2,086	4,383	11,338	7,878
Ten-year average	45,299	4,305	2,576	5,448	13,824	10,150

* Data supplied by the Dominion Bureau of Statistics.

Canada imports a comparatively small amount of potatoes annually. These potatoes come into the country chiefly during the late spring and early summer months, before the Canadian crop is ready for market. Since 1932 exports of Canadian potatoes, chiefly to the United States and Cuba, have declined sharply. Exports during the fiscal year ending March 31, 1935, totalled 758,160 hundredweight, the movement being considerably below the trade prevailing in the years preceding 1932. The falling off of exports to the United States was due mainly to the tariff which was raised in 1930 to 75 cents per hundredweight. Since 1932, potato prices have been low, with the result that the tariff has practically precluded exports, except Canadian seed potatoes, for which there is still a limited demand on account of their superior quality. The situation has been changed by the United States-Canadian Trade Agreement which went into effect January 1, 1936.

TABLE 9.—IMPORTS AND EXPORTS OF POTATOES, CANADA, 1926-1935*

Fiscal year ending March 31	Imports	Exports
	cwt.	cwt.
1926	261,297	4,249,889
1927	282,055	4,986,048
1928	300,886	4,646,076
1929	473,351	2,969,474
1930	769,777	4,774,540
1931	407,525	4,261,268
1932	192,133	2,834,170
1933	112,523	1,117,107
1934	108,935	1,624,617
1935	123,363	758,160

* Canada Year Books, 1927-1936.

Prices received by producers of potatoes have been subject to wide fluctuations and have been particularly low during the last five years, although there was substantial improvement in 1935. The prices paid to New Brunswick producers have averaged considerably below those paid in Ontario and the average for all of Canada. This difference is due in large part to the freight charges which have to be absorbed by Maritime potatoes selling on the markets of Central Canada.

The deflated price shown in column 4 of Table 10 indicates the prices of potatoes as a percentage of the index of other commodities. During the depression years the prices of potatoes fell more than did other prices. This relatively greater decline was common to most agricultural products, but was particularly so in the case of potatoes.

TABLE 10.—PRICES PER HUNDREDWEIGHT RECEIVED BY PRODUCERS OF POTATOES IN NEW BRUNSWICK, ONTARIO AND CANADA, 1926-1935

Year	New Brunswick	Ontario	Canada	Canada deflated price‡
	$ c.	$ c.	$ c.	$ c.
1926	1 32	1 87	1 47	1 47
1927	1 05	1 39	1 17	1 20
1928	0 35	0 93	0 81	0 84
1929	1 35	1 82	1 59	1 66
1930	0 65	0 80	0 83	0 96
1931	0 25	0 39	0 43	0 60
1932	0 50	0 73	0 63	0 94
1933	0 50	1 00	0 77	1 15
1934	0 33	0 55	0 50	0 70
1935	0 73	1 00	0 77	1 07

* Data supplied by the Dominion Bureau of Statistics.
‡ Average prices divided by the index of wholesale prices, 1926 base.

LAND UTILIZATION

The counties of Carleton and Victoria comprise a total of over 2 million acres, of which 597,874 acres were designated as farm land in the Census of 1931. This represents a reduction in farm land of 31,098 acres since 1921. Large areas in the province of New Brunswick are still under forest.

The two counties included in the survey, taken together, have the highest percentage of improved farm land of any in the province. In Carleton county, over 53 per cent of the farm land was improved in 1931, while in Victoria, 38 per cent was improved. The number of occupied farms has been declining slightly

for the past twenty years, but the size of the farms increased from an average of 133 acres in 1911 to 148·8 acres in 1931. Table 11 presents the figures pertaining to the utilization of farm lands in these two counties for the last three census years. Prior to 1911 the county of Victoria was joined with the present county of Madawaska, making a comparison of previous years impossible.

TABLE 11.—NUMBER OF FARMS AND UTILIZATION OF FARM LANDS PER FARM IN THE COUNTIES OF CARLETON AND VICTORIA, NEW BRUNSWICK*

—	1911	1921	1931
Number of farms	4,728	4,499	4,017
	acres	acres	acres
Total farm area	133·0	137·2	148·8
Improved land	62·4	66·8	72·4
Field crops	48·6	46·9	57·9
Idle or fallow	0·1	1·3	0·3
Orchard	0·4	0·4	0·4
Pasture	12·9	14·8	12·4
Other	0·4	3·4	1·4
Unimproved land	70·6	70·4	76·4
Woodland	60·5	63·4	68·0
Natural pasture	7·7	3·8	5·0
Waste	2·4	3·2	3·4

* Census of Canada, 1911, 1921 and 1931.

Improved and Unimproved Land.—Slightly over 50 per cent of the farm land of the counties remains unimproved, but the acreage of improved land per farm is increasing with the size of the farms. Woodland is the chief item of the unimproved portion, accounting for sixty-eight acres per farm. Of the improved land, 57·9 acres were devoted to field crops in 1931.

The farms included in the farm management survey showed a considerably larger acreage than the average for the two counties. This difference may be attributed to the fact that in the survey only farms growing five or more acres of potatoes in 1934 were included. The farms were selected at random, with an effort to secure as representative a sample as possible of the farming in the area. However, as special emphasis was being placed on the potato enterprise, many farms had to be omitted. On the farms included 56·7 per cent of the total area was improved land, as compared with 48·6 per cent for the entire area. Comparison of land utilization between the farms included in the survey and for the counties as a whole is shown in Table 12.

TABLE 12.—UTILIZATION OF FARM LANDS IN CARLETON AND VICTORIA COUNTIES, NEW BRUNSWICK, 1931, AND ON 199 FARMS STUDIED, 1934-1935

—	Carleton and Victoria counties, Census 1931, 4,017 farms		Carleton and Victoria counties, survey 1934-35, 199 farms	
	acres	per cent	acres	per cent
Total farm area	148·8	100·0	190·5	100·0
Improved land	72·4	48·6	108·2	56·7
Field crops	57·9	38·9	86·2	45·2
Pasture	12·4	8·3	22·0	11·5
Other	2·1	1·4	–	–
Unimproved land	76·4	51·4	82·3	43·3
Woodland	68·0	45·7	75·7	39·7
Natural pasture	5·0	3·4	–	–
Waste, yards	3·4	2·3	6·6	3·6

Field Crops.—More than 65 per cent of the area devoted to field crops was used in the production of hay and oats. While a considerable quantity of hay was sold for cash, the majority of the crop produced was used on the farms for feeding to live stock. The next crop in importance from the standpoint of acreage was potatoes, this crop being relied upon to provide the major part of the cash income on the farms included in the survey. The average acreage of potatoes per farm in the counties of Carleton and Victoria was higher than that for any other county in Canada, according to the 1931 Census. The neighbouring county of Aroostook, Maine, is one of the most highly specialized potato-growing areas in the United States.

TABLE 13.—AREA OF FIELD CROPS PER FARM, CARLETON AND VICTORIA COUNTIES, NEW BRUNSWICK, CENSUS 1931, AND ON 199 FARMS STUDIED, 1934-35

—	Carleton and Victoria Census 1931		Carleton and Victoria Survey 1934-35		
	Acres per farm	Per cent of total	Farms with crop	Acres per farm	Per cent of total
Spring wheat	0·7	1·2	150	2·1	2·5
Barley	0·8	1·4	95	1·5	1·7
Oats	15·9	27·5	199	25·4	29·5
Buckwheat	2·4	4·1	95	2·6	3·0
Hay	32·0	55·3	199	39·3	45·6
Potatoes	5 8	10·0	199	13·8	16·0
Other	0·3	0·5	115	1·5	1·7
Total	57·9	100·0	199	86·2	100·0

The average yield per acre of oats harvested in 1934 by those included in the study was 35·9 bushels. The average for the province of New Brunswick was reported as being 30·6 bushels per acre in 1934. There was a wide variation in yield per acre of oats secured by individual farmers. The lowest yield reported was 12 bushels per acre, while the highest was 75 bushels per acre. The distribution of farms according to yield per acre of oats and hay is shown in Table 14.

TABLE 14.—DISTRIBUTION OF FARMS ACCORDING TO YIELD PER ACRE OF OATS AND HAY

Oats		Hay	
Bushel per acre	Number of farms	Tons per acre	Number of farms
10–19	9	Under 0·6	23
20–29	43	0·6–0·79	47
30–39	63	0·8–0·99	34
40–49	55	1·0–1·19	59
50–59	24	1·2–1·39	20
60–69	3	1·4–1·59	10
70 and over	2	1·60 and over	6

Yields per acre of hay ranged from 0·35 ton per acre to 2·5 tons per acre. This wide variation in yield is due chiefly to the variation in soil and to the different types of grasses which are cut for hay. In some of the lighter soils the stands of timothy were very poor with a serious encroachment of daisies and other weeds. On such farms, generally, where lime was used, the crop of red clover was exceedingly good.

A small acreage was devoted to spring wheat and buckwheat, chiefly for the purpose of supplying flour for household use. Barley was grown on less than 50 per cent of the farms included in the survey and is not an important crop in the area. Other crops included peas, beans, fruits and vegetables.

Acreage Trends.—The farmers included in the study grew an average of 13·8 acres of potatoes in 1934. Following the unsatisfactory market conditions of the fall and winter of 1934 and 1935, the acreage seeded to potatoes on these farms was reduced to an average of 9·4 acres per farm. This represents a reduction of 31·9 per cent over the preceding year. Acreages on these farms for the past four years are shown in Table 15.

TABLE 15.—ACREAGES OF POTATOES PER FARM ON 199 FARMS STUDIED, 1934-1935

Year	Acreage per farm	Percentage change
1932	13·7	-
1933	12·7	− 7·3
1934	13·8	+ 8·7
1935	9·4	−31·9

The decrease in acreage recorded in 1933 followed the low prices received by producers for the 1932 crop. The returns from the 1933 crop were more satisfactory and an increase in acreage resulted in 1934.

The study was repeated in part in the summer of 1936, and 70 additional farm records were secured. The low prices received for the 1934 potato crop, coupled with a shortage of cash to buy commercial fertilizer in the spring of 1935, led to a reduction in potato acreage averaging 4·3 acres per farm. This represents a reduction of 33 per cent from the average of 13·1 acres of potatoes grown by these farmers in 1934. Acreages of other crops did not show any material change as between the two years studied. There was a total reduction of 5·2 acres per farm devoted to field crops and hay. In the case of hay the 1935 crop was somewhat heavier than that for the previous year and as a result a greater tonnage was harvested despite the reduction in acreage cut for hay. The crop land not utilized in 1935 apparently was used as pasture.

TABLE 16.—UTILIZATION OF CROP LAND PER FARM ON 70 FARMS, STUDIED 1934-1935 AND 1935-1936

Crop	1934-35	1935-36	Change
	acres	acres	acres
Oats	25·0	25·6	+0·6
Barley	1·9	2·2	+0·3
Wheat	2·2	2·1	−0·1
Buckwheat	1·5	1·4	−0·1
Hay	40·9	39·3	−1·6
Potatoes	13·1	8·8	−4·3
Miscellaneous	0·9	0·9	-
Total	85·5	80·3	−5·2

Crop History.—Yields per acre of grains produced in New Brunswick were slightly higher for the ten-year period, 1926-35, than for the Dominion as a whole. The Dominion averages were lowered by successive drought conditions on the Prairie Provinces in the last half of the period. The average yield per acre of potatoes was 111·5 hundredweight, for New Brunswick, as compared with the Dominion average of 81·8 hundredweight. Climate and soil conditions in New Brunswick appear to be particularly suited to the production of potatoes. Yields of hay were slightly lower in New Brunswick. The yields per acre of grains do not show very wide variations from the ten-year averages, but for potatoes and hay the production per acre has been subject to wide differences.

35040—3½

The value per acre of the crops produced shows material changes from year to year. The values for all crops declined to low levels for the period 1931 to 1935. This was especially true of the potato crop. The value of potato production reached a low of $26.75 per acre in 1931, compared with a return of $188.10 per acre in 1926. Low prices for agricultural products from 1931 to 1935 have not of course been confined to New Brunswick. The value of the hay crop per acre improved considerably in 1934, following two successive short crops.

TABLE 17.—YIELDS AND VALUES PER ACRE OF PRINCIPAL FIELD CROPS, NEW BRUNSWICK, 1926-1935*

Year	Wheat		Oats		Barley		Potatoes		Hay	
	Yield	Value	Yield	Value	Yield	Value	Yield	Value	Yield	Value
	bush.	$	bush.	$	bush.	$	cwt.	$	tons	$
1926	16·5	29·37	25·0	17·75	20·8	19·14	142·5	188·10	1·5	16·12
1927	14·4	23·47	25·7	19·79	23·0	23·92	89·5	95·98	1·3	13·75
1928	17·8	29·55	30·3	21·21	27·6	28·15	129·7	45·40	1·4	14·95
1929	18·8	35·16	30·4	24·02	27·4	27·13	102·8	138·78	1·3	15·81
1930	18·8	18·80	32·5	13·00	29·7	17·82	121·9	79·24	1·5	16·72
1931	18·5	15·91	31·0	11·78	28·9	15·32	107·0	26·75	1·7	11·90
1932	17·7	15·58	31·3	10·33	27·7	14·68	80·0	40·00	1·6	11·84
1933	20·1	19·10	29·3	11·72	26·0	15·86	115·0	57·50	1·1	12·76
1934	20·4	20·40	30·6	13·16	27·2	16·32	128·0	42·24	1·1	14·96
1935	16·9	17·91	27·6	11·14	24·9	15·44	99·0	72·27	1·1	12·21
Ten-year average	18·0	22·52	29·4	15·39	26·3	19·38	111·5	78·63	1·4	14·10
Dominion aver'ge	15·3	–	28·2	–	22·0	–	81·8	–	1·5	–

* Canada Year Book 1926-1936.

FARM CAPITAL

Farmers of the area encountered some difficulty in arriving at the value of their farm capital. After three or four years of low income, values placed on the farm land tended to be low. However, an effort was made to secure a valuation based on the experience of several years, rather than entirely on the present situation.

Farm buildings were reasonably good and in a moderate state of repair. Most of the houses were of frame construction. The average valuation placed on barns was slightly lower than that on houses.

Separate potato storage buildings were used by fifty-two of the farm operators. On the other farms potato storage was provided in the cellars under the houses or barns.

Land values were low, averaging $14.30 per acre for all land and $25.05 per acre for improved land. This compares with the values reported by the Census of Canada for 1931, showing an average of $12.11 for all land in the two counties, or an average of $24.91 for improved land. Much of the unimproved land has some potential value for lumbering or farming purposes, but in 1935 little value could be placed on this land.

Real estate accounted for approximately 75 per cent of the total farm capital on the farms included in the survey.

These farms had an average total acreage of 190·5 acres, compared with the average of 149 acres for all farms in the two counties. The greater acreage of the farms included in the study accounts in the main for the difference between the average capital investment shown for these farms, as compared with the census returns in 1931.

The farms studied were located in the more highly developed farming community of the area.

TABLE 18.—FARM CAPITAL PER FARM, CARLETON AND VICTORIA COUNTIES, NEW BRUNSWICK, CENSUS OF CANADA, 1931, AND ON 199 FARMS STUDIED, 1934-1935

	Survey of 1934-1935		Census 1931	
	Value* $	Percentage of total	Value $	Percentage of total
House	1,430	18·8		
Other house	21	0·3		
Barns	1,166	15·3	1,230	27·8
Potato storage	226	3·0		
Other buildings	74	1·0		
Land	2,711	35·5	1,803	40·7
Total real estate	5,628	73·9	3,033	68·5
Live stock	840	11·0	573	12·9
Equipment, potato	385	5·0		
Equipment, other	605	7·9	825	18·6
Motors	80	1·1		
Feeds and supplies	80	1·1	–	–
Total capital	7,618	100·0	4,431	100·0

* Average of beginning and end of year values.

Accuracy of Estimates.—In an effort to determine the degree of accuracy of the estimates of land and real estate values made by the individual farm operators, the farms were grouped according to the crop index of the individual farms. The crop index was based on the yields per acre produced on the individual farms compared with the average for the area. This calculation indicates that there was a close relationship between the values farmers placed on their properties and the productivity of their farms. Some farms had a large proportion of the total land unimproved, and as this land was not valued as high as improved land, the results have not been as significant as they might have been had all farms been improved to the same extent. However, in column 4 of Table 19, the estimated value of land, per acre of crop land, shows a very marked relationship between the values placed on this land and the productivity of the soil, as indicated by the crop index. The value of the buildings on farms tended to be approximately 50 per cent of the total real estate values. The values of buildings per acre also tended to increase with the productivity of the soil.

TABLE 19.—RELATION OF ESTIMATED VALUES PER ACRE OF REAL ESTATE TO PRODUCTIVITY ON 199 FARMS STUDIED, 1934-1935

Crop index	Per acre of land			Value of land per acre of crop land
	Value of land	Value of buildings	Value of real estate	
	$ c.	$ c.	$ c.	$ c.
Under 80	12 79	12 41	25 20	25·21
80— 99	13 26	14 15	27 41	27 10
100—119	15 19	16 70	31 89	30 58
120—139	13 16	14 78	27 94	38 94
140 and over	19 72	19 03	38 75	52 21
All farms	14 30	15 14	29 44	31 45

While it is recognized that productivity, as shown by the crop index, is only one factor in the determination of the value of farm property, it is nevertheless one of major importance. Such other factors as location, topography and available services must also be taken into consideration. While only the one factor, that of productivity, was used in the compilation of Table 19, the figures do reveal a marked degree of relationship between productivity and the estimated values for land, especially in the case where value per acre of crop land is calculated.

LIVE STOCK ON FARMS

Live stock production, while not an enterprise of major importance on these New Brunswick farms, nevertheless provides a market for most of the home-grown feeds, as well as work for the available family labour. Horses were used almost exclusively for the provision of farm power. Cattle were for the most part of a general purpose type. Moderate sales of cattle for beef were made as well as sales of milk, cream and butter. Hogs were kept on almost all farms. Hens were reported on all farms included in the survey. Foxes were raised as a side line on twelve farms. The numbers and values of the various classes of live stock per farm are shown in Table 20.

TABLE 20.—NUMBER AND VALUES OF LIVE STOCK PER FARM FOR FARMS REPORTING LIVE STOCK AND FOR THE 199 FARMS STUDIED, 1934-1935

—	Farms with these stock	Farms with stock		All farms	
		Number per farm	Value per farm	Number per farm	Value per farm
			$		$
Horses	199	3·5	475	3·5	475
Cattle	199	11·6	255	11·6	255
Swine	197	4·7	36	4·7	36
Sheep	47	15·0	58	3·5	14
Poultry	199	44·2	26	44·2	26
Foxes	12	16·1	558	1·0	34
Total	199	–	–	–	840

Horses.—The number of work horses on farms declined slightly during the year covered by the study. Colts, however, showed an increase almost sufficient to offset the decline in mature animals. It would appear from the figures in Table 21 that most of the colts for replacement purposes are raised within the area. There was, however, a considerable number of horses bought and sold in the district.

TABLE 21.—NUMBER OF HORSES ON HAND, PURCHASES, SALES AND LOSSES ON 199 FARMS STUDIED, 1934-1935

—	Farms with these stock	Beginning of year	Purchases	Sales	End of year	Losses
		No.	No.	No.	No.	No.
Work horses	199	642	69	62	630	34
Colts	51	50	4	2	76	–
Stallions	4	2	2	–	4	–
All classes	199	694	75	64	710	34

Cattle.—Farmers in the area maintained an average of five mature cows per farm, although 109 cows were sold, 21 died and 34 were consumed on the farms. These animals were replaced by purchases of 28 cows and by new heifers freshening during the year. The number of all other classes of cattle was reduced during the year of study. This was in all probability due to the necessity of securing as much cash as possible because of the unsatisfactory returns from potatoes; the chief cash crop. The practice of selling young calves for veal rather than raising them for cows or beef was common in the district. The fact that 90 of the 199 farmers included in the study reported a bull on hand either at the beginning or end of the year, suggests that there was a large number of low-grade animals used for breeding purposes.

TABLE 22.—CATTLE ON HAND, PURCHASES, SALES, LOSSES AND FARM CONSUMPTION ON 199 FARMS STUDIED, 1934-1935

——	Farms with these stock	Beginning of year	Purchases	Sales	End of year	Losses	Consumed on farms
		No.	No.	No.	No.	No.	No.
Cows	199	1,004	28	109	1,004	21	34
Heifers	159	281	3	116	275	4	16
Steers	76	106	12	119	58	1	36
Yearlings	155	345	6	68	270	5	22
Calves	196	545	16	226	525	33	23
Bulls	90	75	14	32	68	–	17
All classes	199	2,356	79	670	2,240	64	148

Swine.—The number of all classes of swine increased on these farms during the year, from May 1, 1934, to April 30, 1935. Many of the farmers of the area did not keep brood sows of their own, but purchased small pigs for feeding. Similarly a large number of young pigs were sold at weaning time by those keeping brood sows. A large number of hogs were killed on the farms for home consumption. Hog production cannot be considered an enterprise of major importance on these farms, total sales of all classes of hogs amounting to 1,177 animals. Purchases of hogs during the same period amounted to 443 animals. This indicates that only about 700 hogs were sold out of the area by these farmers during the year. This small movement of hogs is not sufficient to justify the provision of efficient marketing facilities, consequently the net return to farmers is often not as high as in some other areas of Canada.

TABLE 23.—SWINE ON HAND, PURCHASES, SALES, LOSSES AND FARM CONSUMPTION ON 199 FARMS STUDIED, 1934-1935

——	Farms with these stock	Beginning of year	Purchases	Sales	End of year	Losses	Consumed on farms
		No.	No.	No.	No.	No.	No.
Sows	139	164	10	64	180	6	33
Boars	18	11	3	3	13	—	2
Other hogs	180	733	430	1,110	757	10	268
All classes	197	908	443	1,177	950	16	303

Sheep.—Sheep were kept by 47 of the 199 farmers, from whom farm management records were secured. Small flocks averaging 15·6 head of sheep and lambs were reported on these farms. The number of sheep declined slightly

during the year. Losses were comparatively heavy and most of the lambs were sold, rather than kept on the farm for breeding purposes. While there is sufficient pasture available for the maintenance of a larger number of sheep, such a move would necessitate considerable additional expenditure for fencing.

TABLE 24.—SHEEP ON HAND, PURCHASES, SALES, LOSSES AND FARM CONSUMPTION ON 199 FARMS STUDIED, 1934-1935

——	Farms with these stock	Beginning of year	Purchases	Sales	End of year	Losses	Consumed on farms
		No.	No.	No.	No.	No.	No.
Ewes	45	391	13	55	373	24	2
Lambs	43	324	—	282	305	9	8
Rams	6	6	1	1	8	—	—
All classes	47	721	14	338	686	33	10

Poultry.—All farmers reported hens on hand. The flocks for the most part were small, averaging 42 birds per farm. Turkeys, ducks, and geese were raised by only a few farmers. As in the case of hogs, market facilities are not available for the handling of poultry products on a large scale. The distance of the area from any large centre of population probably has been a factor in the lack of development of the poultry enterprise on these farms.

TABLE 25.—POULTRY ON FARMS, PURCHASES, SALES, LOSSES AND FARM CONSUMPTION ON 199 FARMS STUDIED, 1934-1935

——	Farms with these birds	Beginning of year	Purchases	Sales	End of year	Losses	Consumed on farms
		No.	No.	No.	No.	No.	No.
Hens	199	9,040	232	2,419	8,374	79	2,773
Ducks	5	7	14	6	14	—	—
Geese	11	36	—	44	38	—	5
Turkeys	12	41	—	100	30	—	11
All classes	199	9,124	246	2,569	8,456	79	2,789

The consumption of poultry on farms was high in the district and a fair proportion of mature birds were sold. Prices of eggs were low during the year and the tendency appears to have been to reduce the size of the poultry flocks, although the reduction in numbers shown may have been only of a temporary nature.

Foxes.—Twelve of the farmers visited reported the keeping of foxes as a side-line. These farmers reported an average of eighteen mature foxes and pups per farm. There was a substantial increase in the numbers on hand at the end of the year, compared with the beginning of the period. Adult male and female foxes on farms increased from 74 at the beginning of the year to 106 at the end of the year, while the number of pups increased from 85 to 131. This particular side-line appears to be gaining in popularity in the area and it would seem that with a reasonable amount of experience and care in handling foxes, a substantial contribution to the farm income might be derived from this source.

Changes in Live Stock.—*Numbers.*—Numbers of the various classes of live stock did not change materially in the second year of study. On the farms included in both years' investigation, there were slightly more horses and cows on hand at the end of the second year than in 1935. There were, however, fewer "other" cattle on hand in the summer of 1936 than was the case a year previously. This group includes the younger cattle such as heifers, steers, yearlings and calves. Numbers of hogs on farms showed an increase in the second year of the study. This was in sympathy with the general increase in numbers of hogs throughout Canada. Numbers of sheep on these farms declined slightly, one farmer having disposed of his entire flock.

TABLE 26.—NUMBERS OF LIVE STOCK PER FARM, 70 FARMS STUDIED, 1934-1935 AND 1935-1936

Class	1934-1935		1935-1936	
	Farms with these stock	Average per farm, all farms	Farms with these stock	Average per farm, all farms
Horses	70	3·4	70	3·5
Cows	70	5·0	70	5·2
Other cattle	68	6·7	64	4·7
Swine	65	4·9	61	5·3
Sheep	12	2·9	11	2·6
Total	70	—	70	—

Sales and Purchases.—Total returns from the sale of live stock were slightly lower in 1935-36 than in the previous year. Substantial reduction in sales of young cattle was chiefly responsible for the general lessening of returns. As has been pointed out, sales of these classes of live stock were comparatively heavy during 1934-35 probably due to the low returns from other sources and the consequent need for cash income. Sales of swine were increased during the second year by only 9 animals while returns were increased by $880, reflecting higher prices and sale of a higher proportion of finished hogs. The average return per animal sold was $9.42 in 1935-36 compared with $7.67 for 1934-35.

Purchases of all classes of live stock were sharply lower in the second year of study. The chief factor in this reduction was the fewer horses purchased.

TABLE 27.—SALES AND PURCHASES OF LIVE STOCK, 70 FARMS STUDIED 1934-1935 AND 1935-1936

Class of stock	Sales				Purchases			
	1934-35		1935-36		1934-35		1935-36	
	No.	Value	No.	Value	No.	Value	No.	Value
		$		$		$		$
Horses	28	3,246	29	3,750	37	6,310	29	3,980
Cows	43	1,095	40	1,475	7	149	11	334
Other cattle	224	4,016	168	1,979	26	481	15	402
Swine	453	3,474	462	4,354	147	509	161	474
Sheep	135	676	95	434	4	51	2	11
Total		12,507		11,992		7,500		5,201

Average returns for live stock sales, with the possible exception of horses, have been low in comparison with districts where markets have been more highly developed. The type of cattle kept on these farms is, for the most part, not of a quality that could be expected to command top prices in the market. With the local market for cattle limited there appears to be little encouragement to the live stock enterprise on these farms. In an area where one particular enterprise has been developed and emphasized as the main source of revenue, there appears to be a decided tendency to overlook the importance of the other farm enterprises. This appears to be the case on these specialized potato farms, and with the low returns from sales of live stock and of live stock products it is evident that this farm enterprise is being operated at a loss to the producer. It is not necessarily true that the live stock enterprise should be expanded to increase returns, but it would seem likely that an improvement in type and quality would provide more satisfactory returns. With a surplus of available labour on these farms, especially during the winter months, it would seem quite feasible to give some added attention to the live stock enterprise. A rough calculation of the milk production per cow on the farms studied indicates that the average is somewhat less than 4,000 pounds of milk per cow. The total returns from the sale of dairy produce together with the value of dairy products used in the farm home averaged approximately $38 per cow. This low return can hardly be expected to meet costs of feed, labour, capital and housing for one cow for a year.

EQUIPMENT

Specialization in potato growing necessitates the possession of certain special equipment other than that found on general farms. Almost all farms were equipped with potato planters, sprayers, cultivators, horsehoes, diggers, potato wagons, barrels and baskets. The total value of this special equipment averaged $378 per farm. Some of these implements are expensive when new, but in most cases equipment on farms had not been renewed in recent years, due to low income. During the year under review, an average of only $25 per farm was spent on new equipment and this expenditure was chiefly in connection with new potato barrels and baskets.

The average total value of general equipment on farms was $661. This total includes all the usual equipment found on general farms, as well as a few tractors and trucks. The valuation of all equipment on these farms amounted to $1,039 per farm. This total appears to be about the same as found on farms in other parts of Canada. The Census of Canada for 1931 gives an average valuation for machinery of $893 per farm for all Canada. It will be noted that in Table 28 two averages are presented, one showing the average value of the various items of equipment for all of the 199 farms and the second showing the average value per item of equipment. This latter average gives a more accurate presentation of the present condition of equipment on the farms.

TABLE 28.—EQUIPMENT ON FARMS AND AVERAGE VALUES ON 199 FARMS, STUDIED 1934-1935

Item	Number of farms having item	Average value per farm [1] (all farms)	Average value per item (farms with item)
		$	$
Potato equipment—			
Planter	183	52	57
Sprayer	154	75	97
Duster	12	8	12
Mixing outfit	2	–	1
Cultivator	192	38	40
Horsehoe	195	17	17
Digger	190	68	71
Wagon	190	84	87
Barrels and baskets	195	33	34
Other	30	3	23
Total potato equipment	199	378	—
General equipment—			
Tractor	30	56	373
Truck	13	19	292
Plough	187	50	52
Harrows	188	30	32
Seed drill	144	42	58
Mower	170	44	50
Wagon	117	57	97
Binder	52	14	53
Buggy	128	19	29
Sleds	67	25	75
Harness	185	61	66
Other	161	244	359
Total general equipment	199	661	—
Total all equipment	199	1,039	—

[1] Year-end values.

The figures in Table 28 are the average values as estimated by farm operators, as at April 30, 1935, or at the end of the first year studied. Changes in values over the year due to depreciation charges, purchases and sales are shown in Table 29. In this table the average value of equipment on all of the 199 farms is used, which presents a rather misleading picture, in that many of the items are found only on a few of these farms. This is particularly true in the cases of trucks and tractors.

TABLE 29.—EQUIPMENT ON HAND, PURCHASES, SALES, DEPRECIATION, REPAIRS AND INTEREST PER FARM ON 199 FARMS STUDIED, 1934-1935

Item	Value beginning of year	Purchases	Sales	Value end of year	Depreciation	Operating costs and repairs	Interest	Total charges
	$	$	$	$	$	$	$	$
Potato equipment	392	19	—	378	33	16	23	72
Trucks	22	—	—	19	3	8	1	12
Tractors	63	—	—	56	6	12	4	22
Other equipment	624	6	—	586	37	20	36	93
All equipment	1,101	25	—	1,039	79	56	64	199

Farm Motors.—Automobiles were operated on 135 of the 199 farms included in the survey. These cars were generally four or more years old and had an average value of $270. The automobiles were driven an average of 2,925 miles during the year, having an average cost of operation, including depreciation and interest, of 4·8 cents per mile. The share of these costs charged to the farm and to the potato crop was based on the farmers' estimation of mileage devoted strictly to farm purposes and to the potato crop.

There were 13 farmers operating trucks. These trucks had an average value of $318 and were operated an average of 2,600 miles per truck. Total costs of operation, including depreciation and interest, amounted to $186 per farm, or 7·2 cents per mile.

Tractors were operated on 30 of the farms, having an average value of $394. Those owning tractors operated them an average of twenty days. Average costs of operation including depreciation and interest amounted to $144 per tractor, or 72 cents per hour of usage. The topography of the area is hilly and not particularly suited to the use of tractors. The farms are for the most part small, and it is doubtful whether the operation of a tractor for cultivation purposes is economical on these farms in comparison with the use of horses. It is, however, necessary to have some tractors in the district for such purposes as threshing and sawing wood. Farmers owning these tractors find them useful for field work during the rush season of the year.

TABLE 30.—AVERAGE OPERATING COSTS PER FARM HAVING AUTOMOBILES, TRUCKS AND TRACTORS ON 199 FARMS STUDIED, 1934-1935

—	Autos	Trucks	Tractors
Number having implement	135	13	30
Average value (per unit)	$270	$318	$394
Operating costs—			
Licence	22	39	—
Tires	10	10	—
Repairs	7	8	12
Gasoline	49	51	58
Oil	5	6	8
Other	—	1	—
Total operating cost	93	115	78
Depreciation	32	52	42
Interest	16	19	24
Total all costs	$141	$186	$144
Season's mileage	2,925	2,600	—
Cost per mile (in cents)	4·8	7·2	—
Days of use	—	—	20
Cost per hour (in cents)	—	—	0·72

Changes in Inventory.—The change in inventory from the beginning to the end of the year is a receipt or expense that is frequently overlooked by farm operators in summing up their year's progress on the farm. A loss in inventory is just as much a farm expense as any other outlay, and similarly an increase in farm inventory is part of the farm income, as it is usually the result of either a capital expenditure on the part of the farmer or a holding of saleable produce over until the following year. It will be seen, therefore, that the cash balance at the end of the year is not necessarily any indication of the financial progress made during the year.

There was a net decline of $95 per farm in the inventories of farm capital for the first year studied. The greatest decline occurred in the case of real

estate, which decreased an average of $95 per farm, largely due to depreciation on buildings which was not offset by new buildings or repairs. It is the usual practice of farmers and others to make necessary repairs to buildings during years when there is a surplus of income, and to forego such expenditures in years when farm income is low. Equipment also declined in value an average of $62 per farm. The nature of this decline was similar to that of buildings, in that very few new implements were purchased during the year, while at the same time depreciation was being incurred on the machinery on hand.

The value of live stock increased by $61 per farm for the year under review. This increase may be accounted for in part by the rise in the market value of almost all classes of live stock during the year, and also to a greater number of some classes of live stock on farms at the end of the year. While the unit value of live stock, both at the beginning and end of the year, was kept constant, young live stock raised on the farms were valued at a higher figure at the end of the year. Since the main cash crop of farmers in the area was potatoes and as this crop cannot be carried over from year to year, the amount of feed and supplies on hand at the beginning and end of the crop year was small.

TABLE 31.—FARM INVENTORY PER FARM, MAY 1, 1934 AND APRIL 30, 1935, 199 FARMS STUDIED

—	Value, May 1, 1934	Value, April 30, 1935	Change in inventory
	$	$	$
Real estate	5,676	5,581	−95
Live stock	810	871	+61
Equipment	1,101	1,039	−62
Feed and supplies	79	80	+ 1
Total	7,666	7,571	−95

FARM RECEIPTS

During the crop-year 1934-35 farm receipts were low in almost all farming areas of Canada, but these New Brunswick farmers were especially unfortunate in that the greatest decline in returns occurred in their main cash crop. Farm receipts during this year were divided fairly evenly between the various sources of income. There was no one source of income which dominated the total receipts. Details of the various items shown in Table 32 are discussed in succeeding sections.

TABLE 32.—RECEIPTS PER FARM, ON 199 FARMS STUDIED, 1934-1935

Item	Average per farm	Percentage of total
	$	%
Potatoes	227	22·6
Other crops	238	23·7
Live stock sales	179	17·8
Live stock products	127	12·7
Miscellaneous	104	10·4
Inventory increase	128	12·8
Total	1,003	100·0

Farm receipts on the 70 farms included in the two-year study averaged $960 per farm for 1934-35. For the second year the average was $1,501 per farm. The major cause of this increase of $541 per farm was the increased return from potatoes. In fact, the increase in returns derived from potatoes averaged $679 per farm. This increase, however, was offset to some extent by decreased revenues from other sources. Sales of other crops were lower by $69 per farm in the second year of study. Live stock sales were also lower by $26 per farm. Returns from sales of live stock products improved by $24 per farm. Income represented by increased inventories was lower by $65 per farm in 1935-36.

TABLE 33.—RECEIPTS PER FARM, ON 70 FARMS STUDIED, 1934-1935 AND 1935-1936

Item	1934-35		1935-36		Change
	Average per farm	Percentage of total	Average per farm	Percentage of total	
	$	%	$	%	$
Potatoes	220	22·9	899	59·9	+679
Other crops	222	23·1	153	10·2	− 69
Live stock sales	198	20·6	172	11·4	− 26
Live stock products	97	10·1	121	8·1	+ 24
Miscellaneous	84	8·7	82	5·5	− 2
Inventory increase	139	14·6	74	4·9	− 65
Total	960	100·0	1,501	100·0	+541

There was in 1935-36 a significant change in the percentage of receipts coming from the various sources. Potatoes rose from a position of less than 23 per cent to almost 60 per cent of the total receipts. The situation as shown for 1935-36 represents much more nearly what would be expected on these farms during years approaching normal conditions. It will be noted that while there was some variation in the returns from sources other than potatoes, the differences were not great in amount. Weather conditions were not as satisfactory in the year 1935-36 as they had been in the previous year and consequently there was less surplus grain and hay for sale off these farms.

Crop Sales.—Despite the low prices of potatoes and the small percentage of the crop sold in 1934-35, this crop provided the largest share of the revenue derived from the sale of crops. Potatoes returned 48·4 per cent of all revenue from crops in that year. The greater part of the oat crop was fed to live stock on farms. The only other item of major importance was the sale of hay, which accounted for 18·9 per cent of the total revenue from crops.

The market for hay has been somewhat restricted in recent years due to the curtailment of the lumber industry in the nearby forests. Small amounts of other field crops were sold by a few of the farmers in the area. There were no apple orchards of any size on the farms included in the study.

TABLE 34.—CROP SALES ON 199 FARMS STUDIED, 1934-1935

Crop	Farms selling product	Average per farm	Per cent of total
		$	%
Wheat	36	3	0·6
Oats	146	126	27·1
Barley	25	4	0·9
Mixed grain	3	1	0·2
Buckwheat	30	4	0·9
Clover and timothy	102	88	18·9
Other hay	2	1	0·2
Clover seed	13	5	1·1
Straw	24	4	0·9
Apples	7	1	0·2
Potatoes	194	227	48·8
Other	—	1	0·2
Total	199	$465	100·0

Comparison of crop sales on the 70 farms included in both years of study reveals a marked change in the percentage make up of receipts from crops. In 1934-35, potatoes were responsible for 50 per cent of the income from crops, while the next year this source accounted for over 85 per cent of the crop receipts. Receipts from both oats and hay were reduced during the second year. Receipts from other crops were insignificant in both years. Here again the 1935-36 figures revealed a situation more nearly representing average conditions than did the 1934-35 figures.

TABLE 35.—CROP SALES ON 70 FARMS STUDIED, 1934-1935 AND 1935-1936

Crop	1934-35		1935-36	
	Average per farm	Percentage of total	Average per farm	Percentage of total
	$	%	$	%
Wheat	5	1·1	3	0·3
Oats	122	27·8	90	8·6
Barley	5	1·1	6	0·6
Buckwheat	3	0·7	4	0·4
Hay	73	16·6	49	4·6
Potatoes	220	50·0	899	85·4
Other	12	2·7	1	0·1
Total	440	100·0	1,052	100·0

The results shown in Table 35 bring out the almost complete reliance of these farmers on potatoes for cash income, in so far as crops are concerned.

Disposal of the Potato Crop.—Market conditions for potatoes were not satisfactory during the 1934-35 crop year. Export markets were restricted, and the domestic markets of Central Canada were inadequate to absorb the heavy production which was harvested in all of the five provinces of Central and Eastern Canada. Prevailing prices in the fall of 1934 were extremely low, ranging from 15 cents to 30 cents per barrel on the farm. Dealers were unable to accept more than a fraction of the total crop, even at these low prices.

On the 199 farms included in the survey a total of 358,909 barrels of potatoes were produced. In New Brunswick the quantity of potatoes is generally

measured in barrels, which hold 165 pounds of potatoes, or $2\frac{3}{4}$ bushels. Farmers of the area were able to dispose of only 184,781 barrels, or an average of 928 barrels per farm. The average price received for the potatoes sold was 24 cents per barrel.

The majority of the potatoes sold were delivered direct from the farm or were hauled to market from farm storage. An average of 104 barrels per farm were sold from commercial storage. This type of storage is generally provided by dealers who charge a storage fee on the potatoes sold. The farmers using commercial storage generally haul out their crops in the fall and hold them in storage until they desire to sell.

Most farmers hold a part of their crop for the provision of seed in the following spring and for use in the household during the winter months. Culls and small potatoes are generally fed to live stock. The quantity utilized in this manner was undoubtedly more than normal during 1934-35, because of the inability of the growers to find a cash market for their crop.

TABLE 36.—DISPOSAL OF THE POTATO CROP ON 199 FARMS STUDIED, 1934-1935

Method of disposal	Barrels per farm*	Receipts	Percentage of total
		$	%
Sold from field	326	86	18·0
Sold from farm storage	498	115	27·6
Sold from commercial storage	104	26	5·8
Total sold	928	227	51·4
Held for sale	8	—	0·4
Saved for seed	54	—	3·0
Used for food	18	—	1·0
Fed to stock	216	—	12·0
Dumped	512	—	28·4
Shrinkage	68	—	3·8
Total crop	1,804	227	100·0

* Barrel equals 165 pounds or $2\frac{3}{4}$ bushels.

Over 28 per cent of the 1934 crop was "dumped" by the growers both on the fields, or thrown away. Such a situation does not occur frequently, and potatoes disposed of in this manner are a complete loss with the possible exception of some fertilization value recovered when spread in the field. Potatoes kept in storage normally shrink about 10 per cent if held for the entire winter. This loss is of course unavoidable. Figures and percentages shown in Table 36 do not illustrate the general practice in disposing of the potato crop, but rather show what the situation was in a year of abnormal market conditions.

One of the important reasons for the inclusion of data concerning the 1935-36 crop year was the disposal of the potato crop. It was obvious that the situation where 28·4 per cent of the potato crop was "dumped" was an abnormal one. Also the percentage fed to live stock was more than would be expected under ordinary conditions. The table showing the 1935-36 disposal of the crop shows that no potatoes were "dumped" during that year, and the amount fed to stock dropped from 216 to 60 barrels per farm. Amounts held for sale, used for seed, and for household use remained fairly constant. There is some variation from year to year in the percentage of the crop which is merchantable. This factor depends almost entirely on weather conditions. The non-merchantable portion of the crop is generally fed to live stock.

TABLE 37.—DISPOSAL OF THE POTATO CROP ON 70 FARMS STUDIED, 1934-35 AND 1935-36

Type of disposal	1934-35		1935-36	
	Barrels per farm	Percentage of total	Barrels per farm	Percentage of total
		%		%
Sold off farm	962	55·4	662	78·1
Held for sale	11	0·6	10	1·2
Saved for seed	46	2·6	54	6·4
Used for food	17	1·0	16	1·9
Fed to stock	216	12·5	60	7·1
Dumped	418	24·1	—	—
Shrinkage	66	3·8	45	5·3
Total crop	1,736	100·0	847	100·0

Live Stock Products Sold.—Revenue amounting to $127 per farm was secured through the sale of live stock products. With a rather restricted local market, butter was the most important item in this respect. In most cases the milk was separated on the farms and the cream churned into butter. However, 38 farmers sold cream and 8 sold fluid milk.

Eggs were sold from 156 of the farms, but the average receipts were low, amounting to only $34 per farm. The price of eggs was low during 1934-35 and a large number were consumed in the farm homes.

Although 47 farmers reported sheep on farms, only 16 of these reported sales of wool. In other cases the farmers took the wool to the local mill, where they had it made up into yarn or blankets for home use.

TABLE 38.—LIVE STOCK PRODUCTS SOLD ON 199 FARMS STUDIED, 1934-35

Item	Farmers reporting item	Average per farm (all farms)	Percentage of total
		$	%
Milk	8	1	1·8
Cream	38	27	21·2
Butter	156	64	50·4
Eggs	156	34	26·8
Wool	16	1	0·8
Total	190	127	100·0

On the 70 farms included in the two year study, the receipts from live stock products showed an average increase of $23 per farm in 1935-36 compared with the previous year. This increase was brought about chiefly through improved prices for butter and eggs in the second year. The percentage of total income coming from the various sources remained relatively constant for the two years, with butter gaining slightly in relative importance.

TABLE 39.—LIVE STOCK PRODUCTS SOLD ON 70 FARMS STUDIED, 1934-35 AND 1935-36

Item	1934-35		1935-36	
	Average per farm	Percentage of total	Average per farm	Percentage of total
	$	%	$	%
Milk and cream	20	20·4	21	17·4
Butter	52	53·1	70	57·8
Eggs	25	25·5	29	24·0
Miscellaneous	1	1·0	1	0·8
Total	98	100·0	121	100·0

Miscellaneous Revenue.—A number of farm operators were able to secure part-time labour away from their farms during the first year under study. In this way additional revenue was secured. Most of this work was in connection with road construction during the summer of 1934. In some cases the farmers also found employment for their teams during the slack season on the farms. A small amount of additional revenue was obtained by hiring out machinery and by doing custom work for neighbours.

TABLE 40.—MISCELLANEOUS REVENUE ON 199 FARMS STUDIED, 1934-35

Item	Farms with item	Average revenue per farm	Percentage of total	Average per farm having item
		$	%	$
Man labour	40	31	29·8	152
Team work	18	14	13·5	159
Machine work	15	7	6·7	100
Trucking	3	3	2·9	203
Maple syrup	6	1	1·0	46
Lumber	31	22	21·1	139
Pulp	4	14	13·5	652
Wood	9	8	7·7	87
Miscellaneous	9	4	3·8	166
Total	105	$104	100·0	—

Maple syrup was not produced for sale, except in very small quantities. The abundant supply of lumber, pulp, and firewood on most of the farms afforded an opportunity to secure some additional revenue from the sale of these products. In recent years the market for lumber and wood has not been as great as formerly. This fact has not only reduced income from these sources, but has also curtailed the requirement for winter labour in lumber camps, which at one time provided work for a large number of the farmers and their sons.

On the farms covered by the two year study, the receipts from miscellaneous sources remained practically the same for both years, although there was a considerable change in the individual items. Returns from team work were increased by $25 per farm in 1935-36, chiefly due to the extensive road work being done in the area during the summer of 1935. Revenue classified as "other" included in 1934-35 two farmers who obtained a total revenue of over $1,500 from outside threshing operations. This income was not forthcoming in 1935-36 and accounts for a large part of the decrease shown in the average of this item.

TABLE 41.—MISCELLANEOUS REVENUE ON 70 FARMS STUDIED, 1934-35 AND 1935-36

Item	1934-35		1935-36	
	Amount	Percentage of total	Amount	Percentage of total
	$	%	$	%
Man labour	15	17·8	12	14·5
Team work	15	17·8	40	48·2
Lumber	2	2·4	7	8·4
Pulp	—	—	7	8·4
Wood	19	22·7	14	16·9
Other	33	39·3	3	3·6
Total	$84	100·0	$83	100·0

Farm Products Used.—The farm makes a liberal contribution to the living of New Brunswick farm families. The total value of farm produce, covering a wide variety of products, averaged $277 per farm. Valuation of farm products used in the home was made on the basis of current farm prices. The largest share of this revenue came in the form of dairy products. Eggs were also used in substantial numbers, and farm-produced meat made up an important item. Most farm families maintained a good vegetable garden with some small fruits. In almost all cases wheat flour was milled locally from home-produced grain. The item of $24 per farm for wheat flour indicates that in the majority of cases bread was baked in the farm home.

Such a substantial share of the family living costs produced on the farms is an important factor in the farm finances of the area. In districts where the bulk of the family living must be purchased, a higher gross income from farm activities is necessary. In years of low farm revenue, the contribution of farm products takes on even greater importance.

TABLE 42.—PRODUCTS CONSUMED IN FARM HOMES, ON 199 FARMS STUDIED, 1934-35

Item	Value per farm	Item	Value per farm
	$		$
Milk	34	Mutton	1
Cream	7	Wheat flour	24
Butter	58	Buckwheat	1
Eggs	28	Potatoes	3
Poultry	7	Beans	1
Pork	22	Apples	1
Veal	1	Garden	18
Beef	11	Wood	60
Total			$277

FARM EXPENSES

Current Expenses.—The tendency of farmers in Carleton and Victoria counties to specialize in potato production led to substantial expenditures in connection with fertilizer and labour. The largest single item of expense recorded by the 199 farmers visited during the survey was an average outlay of $284 for commercial fertilizer for the potato crop; in addition there was an average of $27 per farm for purchased fertilizer for other crops.

TABLE 43.—CURRENT EXPENSES ON 199 FARMS STUDIED, 1934-35

Item	Farms with item	Average per farm (all farms)	Percentage of total	Average per farm having item
		$	%	$
Paid labour	165	181	13·7	218
Board paid labour	165	58	4·4	70
Unpaid labour	122	193	14·5	314
Taxes, municipal	199	26	2·0	26
Taxes, school	199	32	2·4	32
Taxes, road	7*	—	—	14
Insurance	170	29	2·2	34
Tractor	32	22	1·7	139
Truck	16	12	0·9	143
Auto	132	53	4·0	30
Electricity	28	4	0·3	31
Telephone	99	9	0·7	18
Cash rent	16	7	0·5	85
Horseshoeing	193	23	1·8	23
Veterinary	69	3	0·2	8
Breeding fees	71	3	0·2	8
Registration fees	16	1	0·1	8
Cow testing	2	—	—	2
Dairy equipment	63	2	0·2	7
Miscellaneous	6	—	—	13
Ice	16	1	0·1	6
Disinfectants	36	—	—	2
Feed grinding	79	4	0·3	10
Machine work	104	13	1·0	26
Gas	28	3	0·2	27
Oil	5	—	—	5
Fertilizer (grain or hay)	99	27	2·0	54
Twine	187	8	0·6	8
Lumber sawing	75	5	0·4	13
Farm papers	159	5	0·4	6
Feeds and seeds	168	36	2·7	43
Machinery repairs	192	37	2·8	38
Building repairs	83	37	2·8	89
Fencing repairs	19	1	0·1	13
Spray and dust	197	33	2·7	33
Potato seed	199	97	7·6	97
Seed treatment	8	—	—	7
Fertilizer (potatoes)	197	284	21·5	287
Lime	51	8	0·6	32
Potato containers	113	14	1·1	25
Selling costs	3	—	—	18
Storage hired	47	18	1·4	76
Trucking	83	16	1·2	39
Fuel for heating	54	3	0·2	10
Fuel for spraying	11	1	0·1	12
Other potato costs	19	5	0·4	78
Total current expenses	199	$1,314	100·0	—

* Road taxes were generally worked out by statute labour.

Labour costs have been divided, in Table 43, into cash costs of hired labour and its board, and the estimated values of unpaid family labour. A considerable amount of hired labour was necessary for the operation of these farms. In most cases the labour was hired by the day or by the month, rather than on a yearly basis. This increased the total cost of labour as wage rates were generally higher when the period of employment was relatively short. Hired labour amounted to $181 per farm, or 13·7 per cent of the total current farm expenses and the cash cost of board for this labour was estimated at $58 per farm, or 4·4 per cent of the total. Unpaid family labour was estimated at $193 per farm. It is doubtful if this charge would have been as great if farmers' sons had had an opportunity of securing labour elsewhere. In many cases the labour supply, especially during the slack winter season, was more than adequate for farm needs.

The cost of potato seed amounted to $97 per farm, or 7·6 per cent of the total cost. This item was only partially cash expenditure. An average of $23 per farm was spent for purchased potato seed. The balance, amounting to $74 per farm was a charge for the home produced seed, or seed traded with neighbours. Farmers in this district make a practice of changing their potato seed about once every three years.

In connection with the cost of operating an automobile, an estimate was made by the individual farmers as to the proportion of the total mileage which was strictly devoted to farm business. The total cost of maintenance and operation of the automobiles was divided on this basis. Other individual items of cost were comparatively small, but taken together they bring the total current expenses up to $1,314 per farm. Numerous small purchases, which are made during the year are difficult to ascertain by the survey method when no records are kept by the farmers. However, all major items have been included in the study, as well as a provision for as many of the minor expenses as possible. Family living costs were not included as farm expenses.

TABLE 44.—CAPITAL EXPENSES ON 199 FARMS STUDIED, 1934-35

—	Farms with item	Average per farm (all farms)	Percentage of total	Average per farm having item
		$	%	$
Live stock bought	156	83	60·6	106
New equipment	34	16	11·7	94
New buildings	17	38	27·7	440
Total capital expenses	164	$137	100·0	—

Capital Expenditures.—Capital expenditures on these farms, as shown in Table 44, indicate the curtailment which takes place in such items of expenditure during years of low farm revenue. Although a large number of farmers purchased live stock during the year, the total value of the purchases amounted to only $83 per farm, and this item is made up to a large extent by the purchase of replacement stock, such as horses, rather than any attempt to expand the live stock holdings of the operator. New machinery was purchased by only 34 farmers. The purchases were for the most part small items. Only 17 farmers made capital expenditures in connection with buildings during the year and here again the individual items were not large.

TABLE 45.—INVENTORY DECREASE ON 199 FARMS STUDIED, 1934-35

—	Farms with item	Average per farm (all farms)	Percentage of total	Average per farm having item
		$	%	$
Live stock	64	26	12·3	83
Feed and supplies	50	12	5·7	46
Real estate	182	117	55·2	123
Equipment	189	57	26·3	63
Total inventory decrease	199	$212	100·0	—

Inventory Decrease.—The principal declines in farm inventories for the year 1934-35 took place in connection with real estate and equipment. These declines were the result of the low capital expenditures made by these farmers during the year of study. Live stock and feed and supplies on hand were lower on many of the farms, but the average decline was not great. While these items are not cash expenses they represent a depreciation of capital goods which must be met at some later date in order to maintain the capital of the farm.

TABLE 46.—CURRENT EXPENSES, CAPITAL EXPENDITURES AND INVENTORY DECREASE ON 199 FARMS STUDIED, 1934-35

—	Farms with item	Average per farm (all farms)	Percentage of total
		$	%
Current expenses	199	1,314	79·0
Capital expense	164	137	8·2
Inventory decrease	199	212	12·8
Total all expenses	199	$1,663	100·0

All items of farm expense, including current expenses, capital expenditures and inventory decrease, are grouped together in Table 46. The total of all cash and non-cash costs for 1934-35 amounted to $1,663, exclusive of interest on investment which is discussed under Farm Indebtedness.

Farm operating expenses were materially reduced during the 1935-36 crop year on the 70 farms included in the two-year study. The greater part of the decline was in the costs directly associated with the production of potatoes. With a reduction of 4·3 acres of potatoes per farm, it would naturally be expected that expenses for commercial fertilizer, spray materials and potato seed would be materially reduced. There was a total reduction of $192 per farm in current farm expenses, of which $93 per farm was effected on account of the reduced use of commercial fertilizer. There was a reduction of $62 per farm in the cost of seed potatoes. This reduction was due in part to the reduced amount of seed necessary for the smaller acreage and also to the very much lower price of seed in the spring of 1935.

Reductions were also made in the case of capital expenditures, these reductions amounted to $44 per farm in the case of new buildings and equipment, and $38 per farm in expenditures for the purchases of live stock. The total reduction in all farm expenses averaged $278 per farm.

In the collection of data for the year 1935-36 it was felt that the questionnaire could be simplified by including only such items of expense as were likely to change from the previous year. For this reason the item headed miscellaneous is similar for both years. While the total of these items amounted to $305 per farm, the individual items are relatively small. Major items included under this heading were: use of auto and truck averaging $65 per farm; insurance on buildings $29 per farm; horseshoeing $23 per farm; fertilizer other than for potatoes $27 per farm; and feeds purchased $36 per farm. While the assumption that these costs would remain constant for the two years may not be entirely true, it is probable that the variations would not be sufficiently great to materially change the results of the study.

TABLE 47.—OPERATING EXPENSES ON 70 FARMS STUDIED, 1934-35 AND 1935-36

	1934-35		1935-36	
	Amount	Percentage	Amount	Percentage
	$	%	$	%
Hired labour	163	15·7	166	19·7
Board paid labour	55	5·3	58	6·9
Municipal taxes	25	2·4	26	3·1
School taxes	29	2·8	28	3·3
Fertilizer	273	26·2	178	21·1
Lime	3	0·3	3	0·3
Copper sulphate	21	2·1	12	1·4
Arsenate	8	0·8	4	0·5
Potato barrels	12	1·2	8	0·9
Machinery repairs	34	3·3	26	3·1
Potato seed	90	8·7	28	3·3
Potato storage	19	1·8	3	0·3
Miscellaneous	305	29·4	305	36·1
Total current expenses	$1,037	100·0	$845	100·0
Live stock bought	110	60·4	74	72·5
New buildings and equipment	72	39·6	28	27·5
Total capital expenses	$182	100·0	$102	100·0
Inventory decrease	220	—	217	—
Unpaid labour	168	—	165	—
Total all expenses	$1,607	100·0	$1,329	100·0

LABOUR

Labour was hired by all but 8 of the 199 farmers during 1934-35. Day labour hired during the rush season of seeding, haying and potato digging was the most frequent type. This class of labour was reported on 180 of the farms. Only 27 farmers kept a hired man for the entire year, and 97 farmers hired men by the month during the summer season.

The average monthly wage of a man hired by the year was $22.06. Men hired by the month received an average wage of $22.58 per month. Day labourers were paid an average wage of $1.72 per day, or $44.60 per month. This rate is somewhat above the prevailing rate for day help, chiefly because men hired for digging and picking potatoes were usually paid on a piece-work basis, rather than by the day. The average monthly wage paid to all farm labourers was $27.88. A charge was made for the board of paid labourers living on the farms. This charge for board averaged $8.89 per month, bringing the total cash outlay for labour and board up to $36.77 per month.

All of the farmers worked at least part of the time on their own farms. However, 11 of these men had other regular occupations, such as game wardens, drovers and salesmen. Unpaid family labour was available on 122 of the 199 farms. Operators estimated their time to be worth an average of $35 per month. This average rate was used for all farm operators. The average value estimated for unpaid family labour was $21.33 per month.

TABLE 48.—SUMMARY OF PAID AND UNPAID LABOUR, RATES OF WAGES AND TOTAL COST PER FARM ON 199 FARMS STUDIED, 1934-35

Type of labour	Number of farms with this item	Total months of labour per farm	Average monthly wage per farm	Total cost of labour per farm
		%	$ c.	$ c.
Paid labour—				
Year help	27	1·6	22 06	35 92
Month help	97	3·3	22 58	73 76
Day help	180	1·6	44 60	71 49
Total paid	191	6·5	27 88	181 17
Board paid labour	191	6·5	8 89	57 78
Total cash outlay	191	6·5	36 77	238 95
Unpaid labour—				
Operator	199	11·7*	35 00	410 85
Operator's family	122	9·0	21 33	192 69
Total unpaid	199	20·7	29 06	603 54
Total paid and unpaid	199	27·2	$30 97	$842 49

* Eleven farmers did not work full time on their farms.

The total cost of hired labour on a per farm basis including board was $238.95. When the value of the unpaid labour of the operators and that of their families was added to the value of paid labour, the total cost of all labour and board amounted to $842.49 per farm.

On the basis of time, 23·8 per cent of the labour was hired; 33·1 per cent was provided by members of the family, other than the operator, and 43·1 per cent was the work of the operator himself. The cost of hired labour was slightly higher than the allowance made for the operator's time and considerably above the estimated value of family labour. On the basis of labour costs, the percentage provided by each type of labour was somewhat different from on a time basis, due to the difference in value of the various types of labour.

TABLE 49.—PERCENTAGE DIVISION OF LABOUR ON THE BASIS OF TIME AND VALUE ON 199 FARMS STUDIED, 1934-35

Type	Percentage of time	Percentage of value
	%	%
Hired	23·8	28·4
Family	33·1	22·9
Operator	43·1	48·7
All farms	100·0	100·0

Comparison of the amounts and total costs of hired labour for the two crop years reveals very little change on the 70 farms studied in both years. Numbers of men hired by the year remained the same, but the rate of wages was higher for the second year, influenced no doubt by the improved potato prices. Month help also averaged the same amount of time per farm in both years, and again rates of wages were higher in 1935-36. Fewer farmers hired day help during the second year, although the number of days was slightly increased. The reduced acreage of potatoes caused less rush of work during the planting and

harvesting seasons. In the case of day labour the average cost per month was materially lower in the second year. This reduction was brought about by the fact that in that year day labourers were hired chiefly on the basis of a daily wage rate rather than by piece-work. The general rate of wages for day help ranged from $1 to $1.50 per day, whereas under the piece-work system, potato pickers frequently earned up to $3 per day.

The total cost of all labour hired was approximately the same for both years. It might be expected that the reduced acreage of potatoes would have resulted in a reduction in hired labour, rather than the slight increase shown on the farms. This situation may be explained in part by the difference in weather conditions as between the two years; the fact that team work off farms was materially increased in the second year; and to the fact that farmers do not readily adjust their labour supply to the amount of available work. There does not appear to have been any increased activity in production of other crops or live stock to utilize the labour released by the reduction in potato acreage.

Records of unpaid family labour were not recorded with sufficient detail on the questionnaires returned from farmers to indicate any change in the supply of this form of labour. Moreover, the more complete records do not indicate any material change in 1935-36 from the previous year. With little or no opportunity to find employment in the urban centres, it would not be expected that many farmers' sons would leave home during the two years studied.

TABLE 50.—SUMMARY OF PAID LABOUR, RATES OF WAGES AND TOTAL COST PER FARM ON 70 FARMS STUDIED, 1934-35 AND 1935-36

Type of labour	1934-35				1935-36			
	Farms with item	Total months per farm	Average monthly wage	Total cost	Farms with item	Total months per farm	Average monthly wage	Total cost
			$ c.	$ c.			$ c.	$ c.
Year help	11	1·8	21 19	39 96	11	1·8	25 48	48 04
Month help	33	2·7	20 68	54 96	34	2·7	23 04	62 06
Day help	63	1·6	45 23	71 66	56	1·7	32 65	54 24
Total paid	70	6·1	36 38	166 58	70	6·2	35 56	164 34
Board	—	—	—	56 38	—	—	—	57 57
Total	70	6·1	$36 38	$222 96	70	6·2	$35 56	$221·91

The Division of Labour.—A productive-man-work-unit is a ten hour day of man labour devoted to any productive enterprise on the farm, or to outside labour. This figure is calculated on the basis of the average amount of man labour required to care for an acre of the various kinds of crops and the different classes of live stock. The productive man work units necessary to produce the potato crop in New Brunswick were included in the data secured from the farm operators. In the cases of other crops and live stock, the units were calculated on the basis of a standard set up, based on farm conditions in the area.

The farm labour on these farms was divided in 1934-35 almost equally between the potato crop, other crops, and live stock, with a small share devoted to outside labour. Since the greater part of the time spent on potatoes and other crops is taken up in the summer months, as well as part of the time devoted to live stock, the division of labour over the year would appear to be somewhat unbalanced. This situation leads to the necessity of hiring additional part time labour for the summer months. Conversely, there is an over supply of labour during the winter months.

The horse labour was divided into about similar proportions to that of man labour, with a slightly higher percentage being devoted to potatoes and less to live stock. Very little of the time horses are working comes during the winter months, and therefore the utilization of horse labour was also unbalanced.

TABLE 51.—DIVISION OF LABOUR ON BASIS OF PRODUCTIVE MAN WORK UNITS ON 199 FARMS STUDIED, 1934-1935

Enterprise	Productive man work units	Percentage of total	Productive horse work units	Percentage of total
Potatoes	144·7	33·5	154·1	38·2
Other crops	143·8	33·3	139·0	34·5
Live stock	122·0	28·2	96·1	23·8
Outside labour	21·7	5·0	14·0	3·5
Total	432·2	100·0	403·2	100·0

The most important change in the utilization of labour during 1935-36 as compared with 1934-35, was the reduction in the labour requirements for the potato crop. This was to be expected in view of the average reduction of 4·3 acres of potatoes grown per farm. Requirements of labour for other crops were also slightly lower in the second year, while live stock and outside work took somewhat more time. It must be borne in mind that these estimates of labour requirements, with the exception of the potato crop, are based on acres of crops and numbers of live stock calculated against a labour standard based on long-time average conditions. Conditions for any one year may vary from the average and, therefore, too much reliance should not be placed on the reduction in labour requirements shown in Table 52. It is doubtful, however, if changes in climatic conditions were sufficiently great between 1934-35 and 1935-36 to explain in full the fact that hired labour actually increased in 1935-36 despite the apparent reduction in labour requirements.

TABLE 52.—DIVISION OF LABOUR ON BASIS OF PRODUCTIVE MAN WORK UNITS ON 70 FARMS STUDIED, 1934-35 AND 1935-36

Enterprise	1934-35		1935-36	
	Productive man work units	Percentage of total	Productive man work units	Percentage of total
		%		%
Potatoes	144·1	34·2	98·8	26·5
Other crops	141·5	33·6	133·1	35·7
Live stock	117·6	27·9	119·1	31·9
Outside labour	18·0	4·3	22·1	5·9
Total	421·2	100·0	373·1	100·0

FARM INDEBTEDNESS

Farm debt in these two counties of New Brunswick was not high, compared with some other sections of Canada, but nevertheless, debt was reported by the majority of the farmers. Of the 199 farmers visited during the study, 75 reported no indebtedness whatsoever. The greatest share of the debt reported was in the form of farm mortgages. This type of debt averaged $704 per farm, or 71 per cent of the total debt. Other interest bearing debts amounted to $173 per farm, or 17 per cent of the total.

Interest rates on mortgages vary considerably from farm to farm, ranging from 4 to 9 per cent. The average rate was 6·3 per cent. On debts secured by note, the average rate of interest was 6·5 per cent. When debts which did not carry interest were included, the average interest rate on all debts was 5·5 per cent.

The ratio of all indebtedness to total farm capital was 13.0:100. The ratio of mortgage indebtedness to real estate value was 12.5:100. These ratios are reasonably low and the burden of interest payments would not be great, if farm income should return to the average level of the previous ten years.

TABLE 53.—INDEBTEDNESS PER FARM AND RATIO OF DEBT TO CAPITAL ON 199 FARMS STUDIED, AS AT APRIL 30, 1935

Type of debt	Farmers having debt	Average per farm	Percentage of total	Average interest rate
		$	%	%
Mortgages	81	704	71	6·3
Debts secured by notes	61	173	17	6·5
Debts unsecured	40	117	12	—
All debt	124	$994	100	5·5

Ratio of debt to farm capital	13·0: 100·0
Ratio of mortgages to real estate value	12·5: 100·0

FINANCIAL SUMMARY

The low prices of potatoes and the lack of an opportunity to market more than a portion of the saleable crop materially reduced the income of the farmers of the area during 1934-1935. As a result of this diminished income from the principal cash crop, returns to the farm operators were low and in most cases did not meet operating costs including depreciation.

Income from capital and operator's labour, or farm income, as shown in Table 54, amounted to an average loss of $660 per farm during the 1934-1935 crop year. This figure represents the loss for the year after payment of all expenses, except interest. In addition to any farm income the farmer may receive, he also receives the farm products consumed in the home and the use of the dwelling on the farm.

In order to compare farms having different amounts invested in capital, it is necessary to deduct from farm income a charge for the use of capital. Farm capital includes the farmer's estimate of the value of his land and buildings, equipment, live stock, and miscellaneous supplies. In this study interest was calculated at 5 per cent on the average capital. The net figure after consideration of interest is called labour income. "The labour income of a farmer is what he gets in addition to the use of a house and the farm products he uses, after paying all farm expenses and after being allowed interest on his capital at the prevailing rates."[4]

A further comparison of farmers' earnings is shown in the calculation of operators' earnings. This figure is the labour income of the farmer plus the privileges secured by the individual farmers in the form of farm products used on the farm and a credit for the use of the dwelling on the farm. The credit

[4] William Allen, University of Saskatchewan. The Farm Business of Saskatchewan, Bulletin 37.

for use of dwelling was 10 per cent of the average value of the house. This credit offsets charges included in farm expenses in connection with the dwelling. Such charges include interest, depreciation, repairs to house and a share of the farm taxes. After making allowance for these additional credits, the figure for operators' earnings averaged a loss of $617 per farm.

TABLE 54.—FINANCIAL SUMMARY ON 199 FARMS STUDIED, 1934-35

—	Average per farm	—	Average per farm
	$		$
Receipts—			
Cash receipts	875	Income from capital and operators labour	−660
Increase in capital	128	Interest on capital at 5 per cent	377
Total	1,003	Labour income	−1,037
Expenses—		Value of farm produce	277
Farm expenses	1,121	Credit for use of dwelling	143
Capital expenditure	137		
Decrease in capital	212	Operators' earnings	$−617
Unpaid labour	193		
Total	1,663		

While many farmers own their own farms and do not have to pay interest on the capital invested, except in the case of farm mortgages or other indebtedness, it is necessary for the purpose of comparing the efficiency of one farm with another, to place all farms on an equal basis by charging a fixed rate of interest on the total capital of the farm, whether this interest has to be paid or not. It should also be remembered that if the farmer does not receive interest on the capital he has invested in the farm, as well as a return for his labour, he may feel obliged to transfer his capital to some more remunerative field. Such action will tend to be restricted during periods of business depression because of the lack of alternative uses for this capital, and also for his labour should he decide to change his occupation. This is one reason why farmers tend to remain on farms and to maintain production despite one or more years of low returns. The average labour income of these New Brunswick farmers for the crop year 1934-35 amounted to a loss of $1,037 per farm. It must be borne in mind, however that this figure does not represent a cash loss of $1,037 per farm, because such items of cost as unpaid labour, a portion of the interest charge and a portion of the depreciation charges are not cash costs. These charges are very often left unpaid during the years of low income to be met at some later date.

The farms included in the study produced an average of 1,531 barrels of saleable potatoes per farm. Of this crop, an average of only 928 barrels of potatoes were sold at an average price of 24 cents per barrel. Assuming that farm expenses and receipts from sources other than potatoes remain constant, it would have required an average price of approximately 82·6 cents per barrel for the saleable crop of potatoes, to meet all expenses and interest at 5 per cent.

The year 1935-36 showed a material improvement over the previous year from the standpoint of potato prices. However, the acreage of potatoes was reduced by an average of 4·3 acres per farm and the yields per acre were considerably lower. In 1934-35 there was an average of 1,531 barrels of saleable potatoes per farm, while in 1935-36 there was an average of only 662 barrels of saleable potatoes per farm. Thus while a comparison made between the two years embraces the same farms, the organization of the business on these farms was somewhat different in each of the individual years.

It was shown in table 47 that total farm expenses were reduced by an average of $278 per farm on the 70 farms included in the two-year study. In Table 33 it was shown that farm receipts had increased by an average of $541 per farm. Thus, there was a net improvement in the years' financial operations amounting to $819 per farm. Farm income, which showed an average loss of $647 per farm on these farms for the 1934-35 crop year, showed a surplus of $172 per farm for 1935-36. Farm perquisites, consisting of the value of farm products consumed in the farm home and an allowance for the use of the farm home, were considered to be essentially the same for the two years. Interest on average capital was also taken at the same figure.

After making all calculations and adjustments, operators' earnings resulted in an average loss of $614 per farm in 1934-35, compared with an average gain of $205 for 1935-36. It will be recalled that all items included under the heading of total expenses were not necessarily cash outlays and therefore, net operators' earnings for the year would be somewhat higher than $205 per farm. Items of non-cash costs include: family labour, interest on capital, except interest on actual indebtedness; depreciation on buildings and equipment and a percentage of the cost of seed potatoes, which were generally taken out of farm supplies.

TABLE 55.—FINANCIAL SUMMARY ON 70 FARMS STUDIED, 1934-35 AND 1935-36 CROP YEARS

——	1934-35	1935-36	Change
	$	$	$
Receipts—			
Cash receipts	821	1,427	+606
Inventory increase	139	74	−65
Total receipts	960	1,501	+541
Expenses—			
Farm expenses	1,037	845	−192
Capital expenditures	182	102	− 80
Decrease in capital	220	217	− 3
Unpaid labour	168	165	− 3
Total	1,607	1,329	−278
Income from capital and operator's labour	−647	+172	+819
Interest on capital at 5 per cent	382	382	—
Labour income	−1,029	−210	+819
Value of farm produce	264	264	—
Credit for use of dwelling	151	151	—
Operators' earnings	−614	+205	+819

Relation of Acreage of Potatoes to Operators' Earnings.—Similar farm management studies made in both Canada and the United States have generally demonstrated the fact that in years of relatively low prices and consequent low returns, the losses have been heaviest on the larger farms, and conversely in years of relatively high prices the higher profits are generally recorded on the larger farms. In measuring size of business of these farms the acreage of potatoes has been used in this analysis. This measure is applicable because year in and year out potatoes are depended on to provide the major part of the farm income.

The two years studied provide an interesting basis for this comparison, in that prices of potatoes were materially improved in 1935-36 over the previous marketing season. Since the reduction of 33 per cent in acreage seeded to potatoes in the second year was a general reduction on the part of almost all growers, the grouping based on 1935-36 acreage of potatoes applies equally well to the farms for the previous year.

TABLE 56.—RELATION OF ACRES OF POTATOES TO OPERATORS' EARNINGS ON 70 FARMS STUDIED, 1934-35 AND 1935-36 CROP YEARS

1934-35			1935-36		
Average acres	Number of farms	Operators' earnings	Average acres	Number of farms	Operators' earnings
		$			$
7·5	25	−349	4·3	25	55
12·0	22	−547	8·1	22	202
20·0	23	−964	14·5	23	378
13·1	70	$−614	8·8	70	$205

It will be noted that despite the reduction in acreage of potatoes the operators' earnings increased consistently in 1935-36 with the increase in acreage, which was a reversal of the situation in the previous year when operators' earnings became a greater loss as acreages of potatoes increased. It might have been expected that since prices paid to producers of potatoes increased from an average of 24 cents per barrel to $1.35 per barrel the change would have been even more marked. However, it must be borne in mind that there were fewer potatoes to sell in the second year and many of the relatively fixed farm costs remained practically the same during both years.

The farm price of potatoes in New Brunswick, for the period 1920 to 1934 averaged $1.44 per barrel. This fact indicates that the 1935-36 crop year more nearly represents an average condition than did the previous year. While the farm price of potatoes has fluctuated between wide limits with varying effects on the individual farm operators, the fact remains that these farmers have continued to rely on this crop for their chief source of income.

The acreage of potatoes grown appears to have had a definite relationship with the returns per acre from potatoes. The group of farmers growing an average acreage of 14·5 acres in 1935-36 had average returns from the sale of potatoes of $103.39 per acre, or $8.40 per acre more than the average of the group growing 4·3 acres per farm. This difference coupled with lower costs on these farms makes an appreciable difference in the net income per acre from potatoes (See Table 75).

TABLE 57.—RELATION OF ACRES OF POTATOES, PRODUCTION, SALES AND RETURNS PER ACRE, ON 70 FARMS STUDIED, 1935-36

Average acreages	Number of farms	Barrels per acre produced	Barrels per acre marketed	Percentage marketed	Return per barrel sold	Return per acre
acres		barrels	barrels	%	$ c.	$ c.
4·3	25	92·8	68·5	73·8	1 39	94·99
8·1	22	96·9	75·2	77·6	1 35	101 78
14·5	23	95·8	76·5	79·8	1 35	103 39
8·8	70	95·6	74·7	78·2	1 36	101 46

There was very little difference in the production per acre as between the various groups; a slightly higher percentage of the crop was marketed on the farms with large acreage, due probably to the amount of potatoes saved for home use and seed being about the same on all farms. The smaller producers received a slightly higher average price per barrel but not sufficient to offset the reduced amounts sold per acre.

COST OF PRODUCTION OF POTATOES

An important part of the survey conducted in Carleton and Victoria counties, was the collection of data for the determination of the cost of producing potatoes in the area. This study covered farming operations for the year commencing May 1, 1934 and ending April 30, 1935, and was supplemented by information covering the succeeding 12-month period. Weather conditions during 1934 were particularly favourable to the production of potatoes and a provincial average yield of 128 hundredweight (78 barrels) per acre was harvested, compared with the ten-year average of 111·5 hundredweight (68 barrels) from 1926 to 1935 inclusive. On the farms studied the average yield was 130·4 barrels per acre. The very high yields recorded on the farms studied compared with the provincial average may be accounted for by the fact that this district is a highly specialized potato growing area where heavy applications of commercial fertilizer are made. Potatoes grown in other sections of the province of New Brunswick are grown chiefly as a side-line crop. This comparatively heavy production was duplicated in almost all potato growing areas in Canada and with export markets restricted and the domestic market curtailed by general economic depression, the available markets were insufficient to absorb the crop. Exceptionally low prices prevailed and in many cases it was impossible to move more than a part of the crop. For this reason it was impossible to secure accurate data on the cost of marketing. The costs presented in this study end with the storage of the crop, ready for market.

Under the limitations of the survey method, the calculations of the cost of production of any farm product which is produced in combination with other enterprises, leads to numerous difficulties in the consideration of partial or joint costs. Examples of this difficulty may be drawn from the attempt to allocate costs of man and horse labour, costs of machinery used, cost of buildings used and many other similar items. In these cases it was necessary to allocate the costs by an arbitrary method, based as far as possible on information secured from the farmers and on data available from complete cost studies.

The items which make up the complete cost of producing a crop of potatoes include all phases of the growing, harvesting and storage of the crop. A number of these items are indirect in nature. Depreciation on equipment and buildings which are used in connection with the storage of the crop, is a cost, which while not directly met from year to year, nevertheless forms a part of the long-time cost of producing the crop. Therefore, this cost must be included as a part of the equipment and other costs. The costs presented in this report represent the average cost for all farms grouped together, rather than those of any individual farm. The variation between farms is considerable and the causes of such variation will be dealt with more fully in succeeding sections.

The farmers visited during this study grew an average of 13·8 acres of potatoes per farm. On 158 farms the seed used was home-grown, or traded with neighbours. Certified seed was selling in the spring of 1934 at approximately $1.25 per barrel, while ordinary seed was valued at 90 cents per barrel. All home-grown seed used was valued at these prices. Purchased seed was calculated at the actual prices paid by the grower. Commercial fertilizer was the largest

single item in the cost of growing potatoes in the area, amounting to $20.53 per acre, or 26·8 per cent of the total costs. Only two of the farmers included in the study did not use commercial fertilizer, while the majority of them used 1 ton per acre.

On 124 farms varying amounts of barnyard manure were used on the potato land, usually being ploughed under the previous fall. The amount used per acre was generally light, because of the danger from potato scab. It was decided for the purposes of this study not to include any direct charge for manure used. However, the labour necessary to haul and spread the manure was charged at the same rate as other labour. It is impossible to place a definite cash value on farm manure and it is also very difficult to determine the residual effect of such fertilization. Some authorities charge approximately one-third of the manure cost to the first crop in the rotation. This method gives a charge approximately the same as that obtained when the labour cost is all charged to the first crop, the method that was followed in this study. Expenditures on spray and dust for fungicide and insecticide purposes were made by almost all farmers.

Labour represents an item of major importance in the cost of growing potatoes. The per acre charge for labour averaged $18.51 per farm, including a charge for the labour of the operator. A detailed account was secured of the labour requirements in growing the potato crop, and the total cost of farm labour was allocated to the various farm enterprises in proportion to the labour used for each enterprise. The rates of wages paid to hired labourers were reported by the farmers. Estimates were taken of the value of unpaid family labour and of the operators' time. The average of these estimates was used as a basis for calculating the value of the labour of the operator and his family.

The charge for horse labour was based on the cost of maintenance of the horses over the period of one year, including costs for feed, horse-shoeing, veterinary and breeding fees. The allocation of this charge to the various farm enterprises was made on a basis similar to that of man labour.

Truck and auto costs charged to the potato crop were based on information secured from the farmers, as to the mileage devoted to the production of the potato crop. Tractor costs were charged on the number of days the tractor operated in connection with potato growing.

Costs in connection with special equipment used only for the cultivation and harvesting of the potato crop were charged directly to that crop. In addition there was a charge to potatoes for the use of such equipment as ploughs, disks and harrows used partly for potato production and partly for other crops. Interest was charged for the period of six months on the growing costs, such as fertilizer and hired labour. Use of land was charged at the rate of $7 per acre, based on the average rental value of the land.

The average cost of production of potatoes for the 1934 crop was $76.37 per acre. On a basis of total barrels of potatoes produced in 1934-35, the average cost amounted to 59 cents per barrel. Assuming that on the average, 85 per cent of the crop produced was of a marketable quality, the cost per barrel would amount to 69 cents.

TABLE 58.—COST PER ACRE OF PRODUCING POTATOES ON 199 FARMS STUDIED, AND ON THE 10 HIGHEST AND 10 LOWEST COST FARMS, 1934-35

—	Average 199 farms	Average 10 highest cost farms	Average 10 lowest cost farms
Acres of potatoes	13·8	9·6	14·4
Growing costs—	$ c.	$ c.	$ c.
Seed	7 00	8 77	5 36
Seed treatment	—	0·04	—
Fertilizer	20 53	25 46	11 90
Spray and dust	2 35	2 60	1 48
Hired sprayer	0 07	0 10	0 32
Man labour	11 41	16 14	7 71
Horse labour	6 19	9 65	4 49
Tractor	0 35	1 18	0 41
Truck	—	0 06	0 05
Auto	0 92	1 98	0 73
Special equipment	2 36	3 45	2 12
General equipment	0 70	0 87	0 66
Other	0 05	0 27	—
Interest	1 26	1 56	0 80
Land use	7 00	7 00	7 00
Total growing	60 19	79 13	43 03
Harvesting costs—			
Man labour	5 80	8 61	4 22
Horse labour	1 16	1 55	0 86
Special equipment	2 80	5 07	2 26
Other	0 14	1 02	—
Total harvesting	9 90	16 25	7 34
Storage—			
Man labour	1 30	1 47	0 87
Horse labour	0 80	1 23	0 73
Building use	2 46	2 44	2 04
Fuel	0 20	0 42	0 08
Other	1 52	5 09	1 12
Total storage	6 28	10 65	4 84
Total all costs	$76 37	$106 03	$55 21

In column 2 of Table 58, the average costs for the 10 highest-cost farms are presented, and in column 3, the average costs for the 10 lowest-cost farms are given. The difference between the various cost items for these two groups is great. Almost all of the individual items of cost were higher on the farms of the high-cost group. Seed was higher, due largely to a more extensive use of certified seed on these farms and also to a greater amount of seed used per acre. Fertilizer costs were $13.56 per acre higher on the high-cost farms and accounted for 26·7 per cent of the increased costs. This difference was due to the fact that on the high-cost farms an average of 1·0 ton of fertilizer per acre was used, compared with 0·56 ton per acre on the farms of the low-cost group. Production per acre was 131·5 barrels on the high-cost farms, compared with 112·4 barrels on the low-cost farms. This increase in yield was probably due in large part to the greater amount of fertilizer used, as well as to the higher-priced seed and to the fact that more labour was utilized in producing the crop on the high-cost farms.

Labour used on the low-cost farms was much less than on the other group, due in part to the smaller crop handled. For the production of 1 acre of potatoes on the low-cost farms, a total of 84 hours of man labour was used, while on the high-cost farms an average of 146 hours of man labour was necessary to cultivate, harvest and store one acre of potatoes. Farmers of the low-cost group grew 14·4 acres of potatoes per farm, compared with an average of 9·6 acres

grown by the high-cost farmers. Hired storage was reported on four of the ten high-cost farms, while this item was included in the costs of only one of the low-cost group. The increased average yield of 19·1 barrels per acre compensated to some extent for the higher costs incurred by the farmers of the high-cost group, yet it was not sufficient to meet the additional cost in full. It would appear that a figure somewhere between these two would result in the greatest net return to the producer.

In the calculation of cash costs per acre, shown in Table 59, such items as depreciation, interest and use of land were not considered as cash costs, with the exception of necessary repairs to machinery, which were required during the year. Cash costs of storage include hired storage, trucking and miscellaneous items. Gasoline, oil, licence and repairs make up the cash items in the total cost of operating autos, truck and tractors.

It will be noted that the cash costs per acre and per barrel are low in comparison with the total cost, but it must be borne in mind that such items as interest and depreciation must be met at some later date, if not within the year under review. While the farm operator and his family may forego wages for their labour during a year of low income, it will be necessary for them to secure some return, if the farm is to be operated successfully for any length of time. Also, home-grown seed, which might have been sold for cash, as could the home-grown feed, which was fed to the horses, are not considered as cash costs for the year under study, but nevertheless make up part of the true cost of production of the potato crop. These facts should be taken into consideration in drawing conclusions from the cash costs, as shown in Table 59.

TABLE 59.—TOTAL COSTS AND CASH COSTS OF PRODUCTION PER ACRE OF POTATOES ON 199 FARMS STUDIED, 1934-35

——	Total costs	Cash costs	——	Total costs	Cash costs
	$ c.	$ c.		$ c.	$ c.
Growing costs—					
Seed	7 00	1 76	Harvesting costs—		
Seed treatment	—	—	Man labour	5 80	1 68
Fertilizer	20 53	20 53	Horse labour	1 16	0 09
Spray and dust	2 35	2 35	Special equipment	2 80	0 56
Hired sprayer	0 07	0 07	Other	0 14	—
Man labour	11 41	3 32			
Horse labour	6 19	0 51	Total harvesting	9 90	2 33
Tractor	0 35	0 17			
Truck	—	—	Storage—		
Auto	0 92	0 61	Man labour	1 30	0 40
Special equipment	2 36	0 55	Horse labour	0 80	0 07
General equipment	0 70	0 17	Building use	2 46	—
Other	0 05	0 06	Fuel	0 20	—
Interest	1 26	—	Other	1 52	1 60
Land use	7 00	—			
			Total storage	6 28	2 07
Total growing	60 19	30 10			
			Total all costs	$76 37	$34 50

INDIVIDUAL COST ITEMS

Seed.—Green Mountain potatoes were the most popular variety grown in the area. There were 108 farmers growing this variety exclusively. Irish Cobblers were grown by 9 farmers exclusively. The remaining 82 farmers were growing more than one variety, chiefly Green Mountain, with additional acreages of Irish Cobblers, Never Rusts, President and Bliss Triumph.

The large proportion of the farmers grew at least some potatoes from certified seed. Certified seed only was used by 74 farmers. Uncertified seed was sown by 104 farmers, and 21 farmers seeded some of each type. An average

of 6·2 barrels per acre of seed was used by these farmers. Home-grown seed was sown by 136 farmers, while 31 operators purchased their seed and 9 traded seed with neighbours. The other 23 farmers used part home-grown and part purchased seed.

Fertilizer.—Commercial fertilizer was used by all but 2 of the farmers visited during the study. The analysis of the fertilizer used showed wide variations, with the 4-6-10 mixture proving the most popular. This mixture was used by 75 farmers, the 5-7-10 mixture was used by 27 operators, and 22 used the 5-8-7 mixture. The rate of fertilization per acre was fairly high, with an average application of 0·9 ton per acre. The average cost per ton was $23.40, with an average per farm of $284. A large proportion of the farmers bought the individual ingredients and mixed their own fertilizer.

Commercial fertilizer was also applied to crops other than potatoes by 99 of the farmers. The 4-6-10 and 2-8-2 analyses were the most frequent mixtures used for other crops. Applications of commercial fertilizer to these other crops were light, averaging 0·12 ton per acre. This fertilizer cost an average of $19.15 per ton, or $27 per farm.

Spray Materials.—The spraying of the growing potato crop as a protection against insect injury and disease is an almost universal practice. All but 2 of the farmers interviewed during this study used either spray or dust on their potato crop. Spray was applied by 184 of the farmers and 13 operators used the dusting method. In both cases an average of four applications were made during the season. There was a slight variation between farms in the number of applications. The most general formula for spraying was the 4-4-40 mixture for the first spray, with the mixture becoming stronger as the season advanced.

An average of 30·5 pounds of lime per acre was applied, purchased at an average price of 1 cent per pound. An average of 27 pounds per acre of copper sulphate was used, valued at 5·7 cents per pound. The poison was usually included in the first two or three sprays and in most cases calcium arsenate was the insecticide used. An average of 4·3 pounds per acre of calcium arsenate having an average price of 10 cents per pound was applied. In a few cases other forms of prepared poisons were utilized. The total cost of spray materials averaged $2.36 per acre, or $33 per farm.

Spraying equipment was available on almost all of the farms. The type of sprayer used was generally horse drawn, with the power coming from the wheels of the machine. The capacity of the spray barrel was generally around 80 gallons. Spray was applied at a pressure of from 150 to 200 pounds. In most cases the sprayer had two or three nozzles per row and covered four rows per sweep. However, there was some variation in the type of machine used by individual farmers. Potato spraying in the area generally commences around the second week in July and continues about once a week, or every ten days during July and August.

Labour on Potato Crop.—Labour requirements for the growing, harvesting and storing of the potato crop in 1934 averaged 93·3 hours per acre. The greater part of this time was devoted to the growing of the crop. Ploughing required 6·9 hours per acre. Farmers ploughed an average of approximately 1½ acres of land per day. The land was disked only on a few of the farms, but harrowing was practised in almost all cases. Considerable time was devoted to picking stones off the potato land. Almost all of the soil of the area tended to be stony, although some of the farms had been quite thoroughly picked in the past.

Fertilizer was generally hauled to the farm by the farmers themselves and in many cases individual ingredients were mixed on the farms. Commercial fertilizer was generally applied at the same time as the seed was planted. Cut-

ting seed required an average of about one hour of labour per barrel. There was a wide variation in the amount of seed cut per day, but from 8 to 10 barrels was considered a good day's work. Planting was done by machine in almost all cases.

Horsehoeing and cultivating were the most important cultivation practices, after the crop was planted. The number of times these operations were repeated depended upon weather conditions and the condition of the soil. Spraying was usually repeated at least four times. Those who grew seed for certification devoted some time to roguing the crop. Picking of the crop at harvest time accounted for the greatest single demand for man labour. This work was generally done by hired labourers, although in some cases sufficient family help was available to handle the job. Digging was done almost entirely by machine. A final day was usually devoted to cleaning up the field and burning the tops.

Labour in connection with storage was chiefly made up of time spent hauling the crop from the field to the point of storage. During the winter only a small amount of time was necessary to tend the storage plant and to keep a fire burning when weather conditions demanded this attention.

TABLE 60.—MAN AND HORSE LABOUR REQUIREMENTS FOR THE PRODUCTION OF POTATOES PER ACRE ON 199 FARMS STUDIED, 1934-35

Item	Man labour hours	Horse labour hours	Item	Man labour hours	Horse labour hours
Manuring	4·2	5·4	Dusting	0·1	0·6
Ploughing	6·9	14·2			
Disking	0·5	0·8	Total growing	57·8	75·8
Harrowing	3·0	6·0			
Picking stones	3·4	3·9	Hand picking	21·2	—
Hauling fertilizer	1·7	3·2	Machine digging (horse)	6·1	12·3
Mixing fertilizer	1·6	—	Machine digging (tractor)	0·3	—
Seed preparation	7·0	—	Cleaning up field	1·5	1·7
Applying fertilizer	0·2	0·2			
Hand planting	0·3	—	Total harvesting	29·1	14·0
Machine planting	4·5	5·9			
Horsehoeing	6·8	13·3	Hauling to farm storage	4·9	8·7
Weeding	2·1	—	Hauling to hired storage	0·7	1·2
Cultivating	7·2	14·2	Labour in storage	0·8	—
Roguing	1·1	—			
Repairing equipment	2·0	—	Total storage	6·4	9·9
Spraying	5·0	8·1			
Mixing spray and dust	0·2	—	Total labour	93·3	99·7

Epuipment Use.—Equipment used in the production of the potato crop was separated according to whether the equipment was used exclusively for the potato crop or whether it was part of the general farm equipment. The cost of operation of the special potato equipment, as well as depreciation and interest was charged directly to the potato crop. The cost of general equipment used both for potato production and for the production of other crops was divided on the basis of acreage of potatoes as a percentage of the total acres in crop. The total charge for equipment to potatoes was $5.86 per farm.

Horse Labour.—The use of horse labour in connection with the production of the potato crop was similar to that of man labour, except where the operation did not call for the use of horses. Usually two-horse teams were used. The total requirements of horse labour were 99·7 hours per acre. The principal operations where horses were used were ploughing, harrowing, planting, horsehoeing, cultivating, digging and hauling to storage.

Tractor Use.—Tractors were used in connection with the production of potatoes on 28 of the farms. These tractors were operated on potato land an average of sixty hours per farm. Ploughing, harrowing and disking were the chief uses to which tractors were put, although a few farmers used them for digging. The topography of the land and the comparatively small acreage of potatoes grown on individual farms does not lead to an economic use of tractor power, except in a very few cases.

Truck Use.—On 18 farms trucks were used for hauling purposes by farm operators. These trucks were operated an average of 462 miles per farm in connection with the potato crop. Trucks were used chiefly to haul the crops to market and also in bringing fertilizer and other materials to the farm.

Storage.—These New Brunswick farms were well equipped with storage facilities for handling the potato crop. On 52 of the 199 farms visited, special potato houses had been constructed for storage purposes. These buildings were usually located on a side hill, the wagon being driven in over the cellar and the potatoes dropped through shutes to the bins. The upper floor of the building is generally used as a machine shed. The capacity of these potato houses averaged 2,300 barrels. The walls of the cellars were generally of stone or concrete construction, and the floors either dirt or concrete.

The other 147 farmers visited utilized the cellars under their houses or barns for storing potatoes. The average capacity of these cellars was approximately 950 barrels. The cellar floors were generally of dirt, although some concrete floors were reported. A few cellars were constructed of cedar. During the most severe winter months it is customary to keep a small stove burning in the cellars to prevent frost damage.

PHYSICAL REQUIREMENTS IN COSTS

The amounts of the various factors which make up the cost of producing a crop of potatoes do not vary greatly from year to year. The costs of these items may be subject to some variation as a result of changes in the cost price of such items as seed, fertilizer and labour. In order to facilitate the calculation of costs for any year, the physical amounts of the various factors of production are presented in Table 61.

TABLE 61.—PHYSICAL REQUIREMENTS OF THE FACTORS MAKING UP THE COST OF PRODUCING POTATOES ON 199 FARMS STUDIED, 1934-35

Item	Amount per acre	Item	Amount per acre
Growing costs—		Harvesting—	
Seed, (barrels)	6·2	Man labour, (hours)	29·1
Fertilizer, (tons)	0·9	Horse labour, (hours)	14·0
Lime, (pounds)	30·5	Special equipment, (rate on investment)	20·6
Copper sulphate, (pounds)	27·0	Miscellaneous, 1934 cost	$0.14
Calcium arsenate, (pounds)	4·3		
Man labour, (hours)	57·8	Storage—	
Horse labour, (hours)	75·8	Man labour, (hours)	6·4
Tractor use, (hours)	8·4	Horse labour, (hours)	9·9
Special equipment, (rate on investment)	17·2	Buildings, (rate on investment)	10·0
Interest on growing costs, (rate)	5·0	Miscellaneous, 1934 costs	$1.72
Land use, rental value per acre	$7.00		
Miscellaneous, 1934 cost	$1 74		

The total labour requirement for the growing, harvesting and storage of the crop amounted to 93·3 hours of man labour and 99·7 hours of horse labour in 1934. The horse labour used was reduced slightly by the fact that tractors were used for field work by 28 of the farmers. The comparatively high rate charged for the use of special equipment is because of the relatively short life of these implements and the fact that this cost includes interest as well as depreciation. In the case of harvesting equipment, such items as baskets and barrels used for picking are commonly replaced about once every three years. Miscellaneous costs include such items as hired equipment, hired storage, fuel used in storage and the use of general farm equipment.

It would be a comparatively simple matter to estimate the approximate cost of production per acre of potatoes for any given year, from the figures given in Table 61. Using the amounts shown in this table and applying the prices prevailing for the given year, the results should be reasonably close to the actual costs for that given year. While methods of production do vary somewhat from year to year due to changes in climatic conditions and other factors, the changes are generally not great.

COST OF PRODUCTION OVER TWO YEARS

Cost of producing potatoes per acre on the 70 farms covered in the two-year study averaged $78.14 per acre for 1934-35 and $82.20 per acre for 1935-36. Items which tended to increase the cost per acre were labour, use of equipment and use of buildings. Increases in these items were offset to some extent by decreases in such costs as seed potatoes, fertilizer, spray materials and hired storage.

The increased costs per acre, with the exception of labour, are found in items in which the total annual outlays are more or less rigid from year to year. Such items as buildings and equipment are available on these farms, and whether used to capacity or not the charges for upkeep and depreciation remain essentially unchanged. The increase in the charge for labour was not due to any material change in the rates of wages, but rather to the fact that farm labour was not utilized as fully in 1935-36 as it had been in the previous year. The labour released by the reduction in potato acreage was not absorbed by increases in acreages of other crops or increased numbers of live stock. Hence, the potato crop was obliged to absorb a greater proportion of the surplus labour than had been the case in the previous year. The labour supply was not decreased in proportion to the reduced production on the farms and therefore the rate per hour for labour was increased.

Prices of seed potatoes were low in the spring of 1935-36, resulting in a reduction of more than 50 per cent in the cost of seed per acre. Slight reductions in the cost of fertilizer and spray materials per acre were effected by a somewhat reduced use of these materials. Prices of fertilizer and spray materials were essentially the same for both years. Storage costs were reduced because of the fact that a greater percentage of the potato crop was sold directly off farms in the fall and also the smaller crop made it possible for farmers to use their own storage facilities.

The fact that the increased costs in 1935-36 were for the most part due to an increase in the per acre charges of the fixed costs, demonstrates the same fact that was shown in the analysis of the 199 farms in 1934-35, namely that costs tended to increase as the acreage is lower. There was a general reduction of potato acreage in 1935-36 and consequently the general increase in costs was to be expected. For the 70 farms included in the two-year study the individual items of cost are shown in Table 62.

TABLE 62.—COST OF PRODUCTION PER ACRE OF POTATOES ON 70 FARMS STUDIED, 1934-35 AND 1935-36

Costs	1934-35	1935-36	Costs	1934-35	1935-36
	$ c.	$ c.		$ c.	$ c.
Seed	6 89	3 14	Special equipment	5 36	7 88
Fertilizer	20 70	20 14	General equipment	0 73	1 07
Spray materials	2 43	2 10	Interest	1 33	1 24
Man labour	18 91	24 18	Land use	7 00	7 00
Horse labour	8 81	8 82	Building use	2 50	3 67
Tractor use	0 45	0 48	Hired storage	1 54	0 33
Truck use	0 25	0 33	Fuel	0 22	0 32
Auto use	0 94	1 38	Miscellaneous	0 08	0 12
Total				$78 14	$82 20

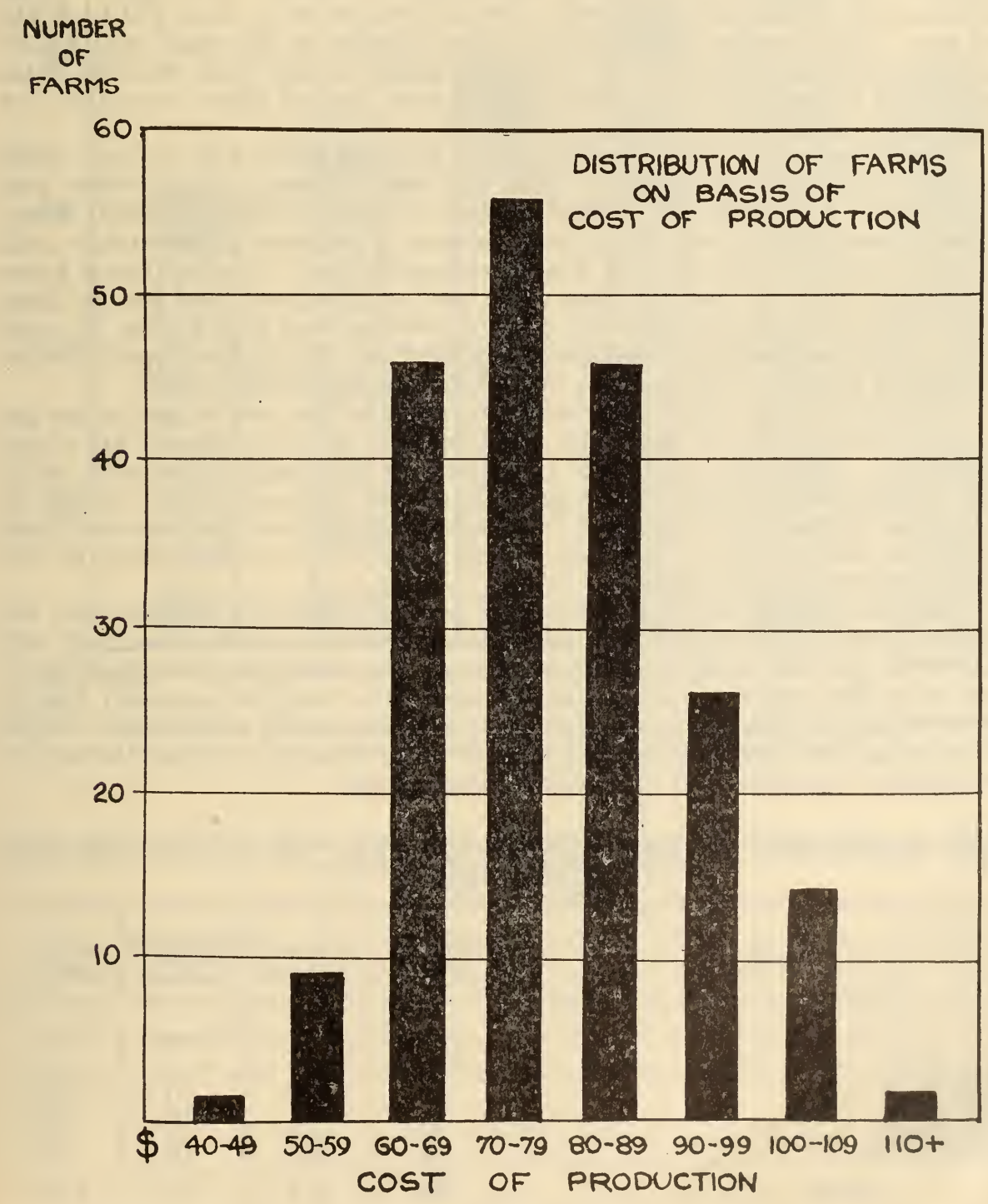

FIGURE 1—There was a wide variation in the cost of producing potatoes per acre in the area studied. Fifty-six of the farms showed costs ranging from $70 to $79 per acre.

In 1935-36 the yield per acre of potatoes was materially lower than in the previous year and consequently the cost per barrel of marketable potatoes was much higher. The 1934-35 cost per barrel of marketable potatoes averaged only 59 cents per barrel, while for 1935-36 the cost per barrel of marketable stock was $1. This wide difference demonstrates the impossibility of calculating a figure of cost per barrel which will be of any value for more than the one year covered by the investigation. Cost per barrel is influenced so greatly by the fluctuations in yield per acre that little significance should be placed on this figure.

Variations in Costs.—The sorting of the farms of the 1934-35 study according to cost of production of potatoes per acre, results in a distribution closely approximating a normal curve, indicating that the number of farms included was sufficient to provide representative results. The largest group containing 56 of the farms showed a cost of production of from $70 to $79.99 per acre. The average figure for all farms included in the study was $76.37. In each of the groups above and below the largest group, there were 46 of the farms. Of the remaining 51 farms, slightly more showed higher costs than low costs. The distribution is shown in Figure 1.

Ten farms had a cost of production of potatoes below $60 per acre, while 16 farms had costs in excess of $100 per acre. These extreme cases were characterized by special circumstances which existed on these particular farms. In some cases where there was a large acreage of potatoes and relatively little fertilizer used, the cost per acre was exceptionally low. On other farms where the acreage was small and the fixed costs, such as machinery used and buildings were relatively high, the cost per acre of potatoes was high. Also, in cases where a large percentage of the labour was hired and the degree of specialization in potatoes high, the cost per acre for labour was exceptionally high.

In Figure 2, the farms are shown according to the cost of production per acre of potatoes and the individual items making up the total cost are shown separately. From this diagram it is possible to distinguish those costs which were causing the increases in cost per acre on the high cost farms. It will be noted that the two factors showing the greatest influence on total costs are those for labour and fertilizer. However, almost all of the individual items of cost tend to increase on the higher cost farms.

Farmers having the lowest cost per acre of producing potatoes are not necessarily the most efficient producers. Low costs may also be associated with low yields per acre and the resultant increase in production from higher costs may more than offset the additional expense. This would be especially true in years when the prices received for potatoes were reasonably satisfactory. Table 63 indicates that there was in 1934 little or no relationship between the cost of production of potatoes and the resultant farm income.

TABLE 63.—RELATION OF COST OF PRODUCTION PER ACRE TO YIELD PER ACRE AND TO FARM INCOME, 1934-35

Costs per acre	Number of farms	Acres of potatoes	Marketable potatoes per acre	Farm income
			barrels	$
Under $65.00	33	15·1	101	−621
$65.00—$74.99	59	15·4	111	−600
$75.00—$84.99	53	14·1	112	−738
$85.00—$94.99	30	11·5	118	−523
$95.00 and over	24	10·4	116	−859
All farms	199	13·8	111	$−660

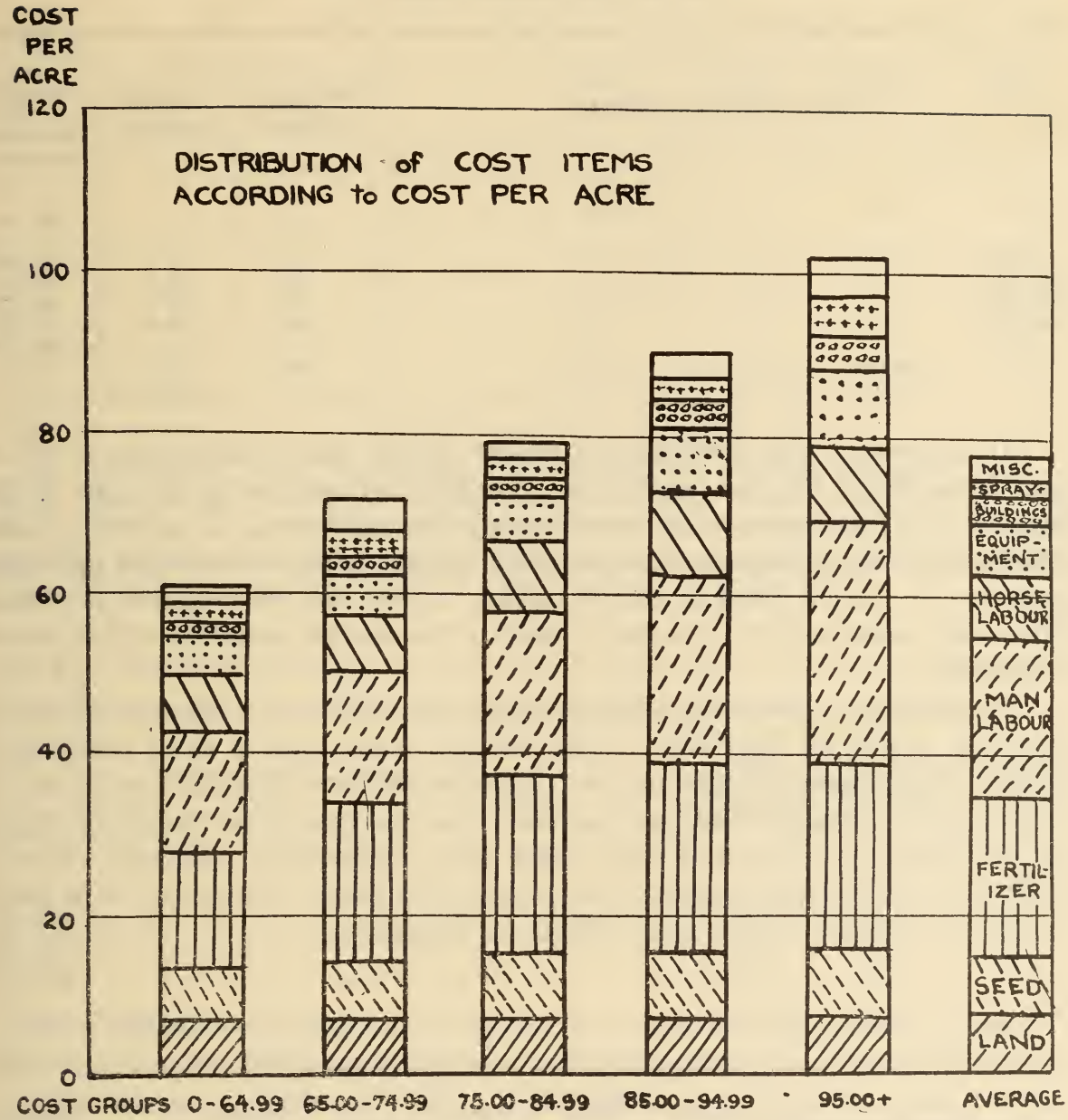

FIGURE 2—Almost all items of cost tended to increase on the farms having high cost of production of potatoes per acre. Man labour and fertilizer were the two most important items of cost.

FACTORS AFFECTING COST OF PRODUCTION OF POTATOES AND FARM INCOME

Size of Business.—The farms were grouped on the basis of productive-man-work-units utilized during the year as a measure of size of business. Four groupings were made on this basis. The acreage of potatoes increased as the productive-man-work-units increased. The cost of production of potatoes per acre did not show any significant difference with the increase in size of business on this basis.

TABLE 64.—RELATION OF SIZE OF BUSINESS TO COST OF PRODUCTION OF POTATOES, 1934-35

Productive-man-work-units	Number of farms	Acres of potatoes	Cost of production of potatoes per acre
			$ c.
0—300	35	8·5	75 88
301—400	55	10·2	78 82
401—500	60	15·5	75 22
Over 500	49	19·6	76 53
All farms	199	13·8	76 37

In connection with the financial results for the year of operation, it will be seen from Table 65 that while total receipts increased with the size of the business, the total expenses increased at a more rapid rate. The result of this difference in rate of increase was that farm income, labour income and operators' earnings all became greater minus figures, as the size of business increased. This result could only be expected in view of the market situation which existed in 1934-35.

In using the calculated productive-man-work-units as a measure of size of business, it will be seen from Table 66 that there was a close relationship between this measure of size and such other measures as acres of land, acres of crops, acres of potatoes and farm capital. For this reason the results of grouping the farms on any one of these bases were substantially the same. Size of business was the most important factor affecting farm income, and as a result the effects of other factors were difficult to segregate.

TABLE 65.—RELATION OF SIZE OF BUSINESS TO FINANCIAL SUMMARY, 1934-35

Productive-man-work-units	Total receipts	Total expenses	Farm income	Interest	Labour income	Farm perquisites*	Labour earnings
	$	$	$	$	$	$	$
0—300	370	774	−404	230	−634	303	−331
301—400	817	1,353	−536	307	−843	400	−443
401—500	1,113	1,769	−656	394	−1,050	427	−623
Over 500	1,529	2,516	−987	541	−1,528	518	−1,010
All farms	1,003	1,663	−660	377	−1,037	420	−617

* Value of farm products consumed in home and 10 per cent of value of house.

TABLE 66.—RELATION OF PRODUCTIVE-MAN-WORK-UNITS TO OTHER MEASURES OF SIZE OF BUSINESS, 1934-35

Productive-man-work-units	Acres of land	Acres of crop land	Acres of potatoes	Farm capital
				$
0—300	114·9	48·5	8·5	4,618
301—400	147·1	71·7	10·2	6,171
401—500	190·0	89·0	15·5	7·946
Over 500	294·1	126·0	19·6	10,998
All farms	190·5	86·2	13·8	7,618

In connection with the labour used by farmers of the area, the type of labour changed as the size of the business increased. The percentage of work done by the farm operator himself became lower and consequently the percentage of hired labour became higher. Changes in the percentages of the various types of labour used on the basis of time is shown in Table 67.

TABLE 67.—RELATION OF SIZE OF BUSINESS TO THE TYPE OF LABOUR USED, 1934-35

Productive-man-work-units	Hired labour as percentage of total	Family labour as percentage of total	Operator's labour as percentage of total
	%	%	%
0—300	13·8	23·7	62·5
301—400	15·9	36·2	47·9
401—500	25·9	32·5	41·6
Over 500	31·8	34·8	33·4
All farms	23·8	33·1	43·1

The amount of labour utilized in producing an acre of potatoes did not vary a great deal as the size of business increased, but the rate charged per hour was lower on the larger farms because of the higher percentage of the total labour used productively. As a result of the reduction in the rate charged, the labour cost per acre of potatoes was lower on the larger farms.

TABLE 68.—RELATION OF SIZE OF BUSINESS TO LABOUR COSTS IN THE PRODUCTION OF POTATOES, 1934-35

Productive-man-work-units	Acres of potatoes	Hours of labour per acre	Rate per hour labour	Labour charge per acre
			cts.	$ c.
0—300	8·5	94·0	24·1	22 65
301—400	10·2	92·6	21·6	20 00
401—500	15·5	91·6	18·9	17 31
Over 500	19·6	95·2	18·4	17·52
All farms	13·8	93·3	19·8	18 51

Acres of Potatoes.—When the farms were grouped according to the acres of potatoes grown on individual farms in 1934, the cost of production per acre of potatoes declined as the acreage increased. However, after the acreage reached an average of about 18 acres per farm, the cost per acre showed an increase. This would indicate that the point of lowest cost in producing potatoes in this area is reached when the acreage approximates 18 acres per farm. The cash cost of production per acre did not show any marked tendency to change with the acreage of potatoes grown.

TABLE 69.—RELATION OF ACREAGE OF POTATOES TO TOTAL COST OF PRODUCTION AND CASH COSTS OF PRODUCTION PER ACRE OF POTATOES, 1934-35

Acreage of potatoes	Number of farms	Cost of production per acre	Cash cost of production per acre
		$ c.	$ c.
5— 8·9	51	82 72	31 47
9—12·9	62	79·86	34·21
13—16·9	30	73·56	32·68
17—20·9	25	73·47	31·04
21 and over	31	74 35	38 51
All farms	199	$76 37	$34 50

Considering the individual items making up the total cost of production of the potato crop, the chief item by which costs were reduced, as the acreage of potatoes increased, was that of man labour. The labour charge per acre amounted to $22.71 on the farms growing from 5-8·9 acres of potatoes, while for the group growing over 21 acres, the labour charge was only $16.35 per acre. This reduction was due almost entirely to the fact that labour on the more intensive potato farms was used more efficiently throughout the year. The rate per hour showed little variation between the various groups.

TABLE 70.—RELATION OF ACREAGE OF POTATOES TO HOURS OF LABOUR AND TOTAL COST OF LABOUR FOR THE POTATO CROP, 1934-35

Acres of potatoes	Hours of labour per acre	Rate per hour of labour on potatoes	Total labour cost per acre	Labour as percentage of total costs
		$ c.	$ c.	%
5— 8·9	106·6	0 21	22 71	27·4
9—12·9	105·5	0·19	20 09	25·2
13—16·9	96·4	0 19	18 77	25·5
17—20·9	96·8	0 18	17 22	23·4
21 and over	79·8	0 20	16 35	22·0
All farms	93·3	$0 20	$18 51	24·2

Equipment costs were also lower on the farms growing a large acreage of potatoes. This reduction was brought about by a more efficient use of machinery. Certain special equipment and machinery was required regardless of the acreage of potatoes grown. In no case was the acreage of potatoes sufficiently large to necessitate the use of more than one potato planter, cultivator, or digger. In addition to the per acre costs of operation, depreciation and interest in connection with these implements becomes less as the acreage of potatoes increase.

The figures shown in Table 71 indicate a substantial reduction in equipment costs per acre on the larger farms. This figure shows a slight exaggeration of the facts, inasmuch as the rate of depreciation charged was not higher on the farms where the machinery was used for a longer period of the year. However, this refinement would not materially change the results nor the conclusion that costs are reduced when machinery is used more nearly to its capacity.

Other items of cost, such as fertilizer, spray materials and seed do not show any marked change with increase in acreage of potatoes. The amounts of these items do not vary materially from farm to farm and the purchases made by the more highly specialized potato growers were not sufficiently large to secure any effective reduction in prices.

TABLE 71.—RELATION OF ACREAGE OF POTATOES TO COST OF EQUIPMENT USED, 1934-35

Acres of potatoes	Cost of equipment used per acre	Equipment used, as percentage of total costs
	$ c.	%
5— 8·9	8 16	9·9
9—12·9	6 95	8·7
13—16·9	5 79	7·9
17—20·9	5 33	7·2
21 and over	4 53	6·1
All farms	$5 86	7·7

The farm income secured in 1934-35 by farmers of the area declined sharply as the acreage of potatoes increased. This result is to be expected in a year such as 1934, when potato prices were so very low. The farmers growing large acreages of potatoes were more fully dependent on this crop than those growing only a small acreage of potatoes, and consequently suffered most by the low returns from the main cash crop. In addition, these farms were generally the largest and their costs of maintenance and operation were greater than was the case on the smaller farms. It must always be borne in mind that the year's business covered by the first year of this study was most unfavourable in so far as potatoes were concerned, and no conclusion regarding the advisability of the continuation of potato production on the present scale should be drawn without consideration of both years studied and the range of potato prices in the past.

TABLE 72.—RELATION OF ACRES OF POTATOES TO FARM INCOME, 1934-35

Acres of potatoes	Number of farms	Marketable potatoes per acre	Acres of crop land	Farm income
		barrels	acres	$
5— 8·9	51	102	68·3	−307
9—12·9	62	113	81·6	--447
13—16·9	30	111	89·9	−648
17—20·9	25	110	99·4	−859
21 and over	31	113	110·5	−1,517
All farms	199	111	86·2	$−660

The farm price of potatoes for 1935-36 averaged $1.35 per barrel, and all saleable potatoes except those saved for seed and household use were sold. This changed situation brought about an entirely different result from the previous year in so far as the relation between acres of potatoes and farm income was concerned. During this year the farm income rose appreciably as the acreage of potatoes increased. The changed relationship would probably have been even more marked had the yield per acre been higher, as costs per acre tended to decline with the increased acreage of potatoes.

TABLE 73.—RELATION OF ACRES OF POTATOES TO FARM INCOME ON 70 FARMS STUDIED, 1935-36

Acres of potatoes	Number of farms	Marketable potatoes per acre	Acres of crop land	Farm income
		barrels	acres	$
4·3	25	78·9	68·4	11
8·1	22	84·8	81·1	130
14·5	23	84·4	90·2	387
8·8	70	82·0	80·3	$172

When the farms studied were grouped on the basis of acreage of potatoes, cost of production declined sharply with an increase in acreage. The 1935-36 acreages were generally less than those reported in the previous year and acreages did not reach sufficient proportions to indicate at what point costs commence to increase with increased acreages. The results of a grouping based on acreage is shown in Table 74.

TABLE 74.—RELATION OF ACREAGES OF POTATOES TO COST OF PRODUCTION PER ACRE ON 70 FARMS STUDIED, 1935-36

Average acres Number of farms	4·3 25	8·1 22	14·5 23	8·8 all farms
	$ c.	$ c.	$ c.	$ c.
Seed	1 72	2 43	3 98	3 14
Fertilizer	22 99	20 06	19 25	20 14
Spray materials	2 00	2 04	2 16	2 10
Man labour	29 04	25 48	21 92	24 18
Horse labour	10 55	8 90	8 22	8 82
Tractor use	0 07	0 75	0 46	0 48
Truck use	0 18	0 62	0 22	0 33
Auto use	2 36	1 25	1 13	1 38
Special equipment	13 49	7 22	6 42	7 88
General equipment	1 38	0 96	1 02	1 07
Interest	1 32	1 24	1 21	1 24
Land use	7 00	7 00	7 00	7 00
Building use	4 54	3 95	3 24	3 67
Hired storage	—	—	0 62	0 33
Fuel	0 42	0 46	0 22	0 32
Miscellaneous	0 18	0 23	0 04	0 12
Total	$97 26	$82 59	$77 11	$82 20

The most important items showing decreases in costs resulting from increased acreage were again man labour and equipment use. There was a total reduction of $20.15 per acre in costs between the highest and lowest acreage groups. Man labour and equipment use accounted for $14.55 of the total reduction. Further reductions were brought about in such costs as fertilizer, horse labour, auto use, and building use. The only important item of cost to show a higher figure as

the acreage of potatoes increased was that of seed potatoes. This was probably due to a greater number of certified seed growers appearing in the group of larger producers.

Reference has already been made, in connection with the returns per acre from potatoes (Table 57), to the greater returns per acre and to lower costs on the farms growing larger acreages of potatoes. This comparison is shown in Table 75. This table demonstrates the fact that for the 1935-36 crop year, it was more profitable to have a reasonably large acreage of potatoes. On the 23 farms growing an average of 14·5 acres of potatoes per farm, the net return of $26.26 per acre gave an average surplus from the potato crop of $381 per farm.

TABLE 75.—RELATION OF ACRES OF POTATOES TO NET RETURNS PER ACRE, 70 FARMS STUDIED, 1935-36 CROP YEAR

Average acreage	Number of farms	Returns per acre, potatoes	Costs per acre	Net returns per acre
		$ c.	$ c.	$ c.
4·3	25	94 99	97 26	−2 27
8·1	22	101 78	82 59	19 19
14·5	23	103 39	77 11	26 26
8·8	70	$101 46	$82 20	$19 26

Degree of Specialization.—The degree to which the farmers included in the study specialized in the production of potatoes may be measured in a variety of ways: the percentage of crop acres in potatoes, the percentage of total labour devoted to potatoes, or the percentage of total receipts derived from potatoes. In view of the market situation which existed in 1934-35, it would appear that either of the first two methods would be the most satisfactory measures of specialization for this study. A comparison of these two methods is shown in Table 76 and indicates that the results would be substantially the same, should either method be used. That is, the records which would fall into each group, using either method of sorting, would be practically the same records, because of the close relationship between the percentage of crop acres in potatoes and the percentage of labour devoted to potatoes. The records were sorted therefore on the percent of labour devoted to the potato crop.

TABLE 76.—DEGREE OF SPECIALIZATION IN POTATOES, 1934-35

Acreage of potatoes	Number of farms	Percentage of crop acres in potatoes	Percentage of labour devoted to potatoes
		%	%
5— 8·9	51	9·2	22·9
9—12·9	62	13·0	29·5
13—16·9	30	16·0	34·0
17—20·9	25	18·7	40·1
21 and over	31	25·8	43·6
All farms	199	16·0	33·5

The cost of production of potatoes per acre did not vary materially according to the degree of specialization. The differences in costs which did exist between the various groups based on specialization, did not follow any regular

movement and therefore, no positive conclusion could be drawn from this division of the farms. The same is also true of the relationship of cash cost per acre of potatoes to the degree of specialization. As has been pointed out previously, the cost of production of potatoes per acre is so dependent on the size of business, it is difficult to separate any other factors which may have an influence on the cost of production per acre.

TABLE 77.—RELATION OF DEGREE OF SPECIALIZATION IN POTATOES TO COST OF PRODUCTION PER ACRE, 1934-35

Percentage of man-work-units on potatoes	Number of farms	Acres of potatoes	Cost of production per acre	Cash cost per acre
			$ c.	$ c.
Under 23	38	7·6	72·80	28 26
23·0—29·9	50	10·4	77 96	36 10
30·0—36·9	42	14·8	76·55	36 24
37·0—43·9	34	16·9	77 64	35 40
44 and over	35	21·4	75 66	34 56
All farms	199	13·8	$76 37	$34 50

The relation of degree of specialization in potatoes to the resultant farm income shows that farm income declined as the percentage of man-work-units on potatoes became greater. Here again, the fact that the more highly specialized farms were also the farms growing the largest acreage of potatoes so influences the result that it would be unfair to conclude that the greater the degree of specialization, the lower the income, except in years of low potato prices. When the price of potatoes in 1935-36 approached the fifteen-year average farm price of $1.44 per barrel (1920-1934), the results were quite different.

TABLE 78.—RELATION OF DEGREE OF SPECIALIZATION IN POTATOES TO FARM INCOME, 1934-35

Percentage of man-work-units on potatoes	Number of farms	Acres of potatoes	Marketable potatoes per acre	Farm income
			barrels	$
Under 23	38	7·6	101	−280
23·0—29·9	50	10·4	115	−394
30·0—36·9	42	14·8	109	−738
37·0—43·9	34	16·9	111	−894
44 and over	35	21·4	113	−990
All farms	199	13·8	111	$−660

A study of the relationship between degree of specialization as measured by percentage of man-work-units devoted to the potato crop in 1935-36 is presented in Table 79. Here again the percentage of man-work-units is closely associated with acres of potatoes grown. In this particular year, when the farm price of potatoes averaged $1.35 per barrel, the more highly specialized farms show the highest farm incomes. It would seem therefore, that a producer in determining either his acreage of potatoes or the percentage of his time he should devote to potatoes in any given year, must give attention to the probable price at which the crop may sell. The more highly specialized group also produced a slightly higher average yield of marketable potatoes per acre.

TABLE 79.—RELATION OF DEGREE OF SPECIALIZATION IN POTATOES TO FARM INCOME, 1935-36

Percentage of man-work-units on potatoes	Number of farms	Acres of potatoes	Marketable potatoes per acre	Farm income
			barrels	$
Under 20·0	19	5·1	67	109
20·1—29·9	30	8·0	74	132
30·0 and over	21	14·6	79	306
All farms	70	8·8	75	$172

Crop Index.—The crop index of individual farms was computed by comparing the yields of grain and hay secured by individual farmers with the average yield harvested throughout the district.[5]

The farms were grouped on the basis of this crop index to determine the effect of yield on farm income and labour income, and also, to determine if the cost of production of potatoes per acre varied materially with crop index as a measure of productivity of the farms.

TABLE 80.—RELATION OF YIELD PER ACRE TO FARM INCOME AND LABOUR INCOME, 1934-35

Crop index	Number of farms	Farm expenses	Farm receipts	Farm income	Interest at 5 percent	Labour income
		$	$	$	%	$
Under 80	40	1,285	728	−557	334	−891
80— 89	52	1,424	895	−529	341	−870
100—119	57	1,868	1,139	−729	379	−1,108
120— 139	30	1,940	1,080	−860	408	−1,268
140 and over	20	2,040	1,333	−707	518	−1,225
All farms	199	$1,663	$1,003	$−660	377	$−1,037

The labour income of farmers harvesting more than average yields was less during 1934-35 than that of those securing less than average yields, or rather, the loss was greater on the high-yielding farms. This paradoxical result was brought about by the fact that the farms included in the group securing high yields were also the larger farms from the standpoint of crop acres and acres of potatoes. For this reason, the fact that they received better than average yields and slightly higher gross incomes was offset by the greater amount of expense incurred. These farms also were valued at higher figures and the charge for interest on capital was correspondingly higher.

The cost of production of potatoes per acre was not materially affected by the productivity of the farms. Farmers securing the greatest yields spent substantially the same amounts per acre on potatoes as those securing somewhat lower yields. The cost per barrel produced was lower on the high-producing farms.

[5]For method of calculation, see Appendix page 70.

TABLE 81.—RELATION OF YIELD PER ACRE TO COST OF PRODUCTION OF POTATOES PER ACRE AND PER BARREL PRODUCED, 1934-35

Crop index	Cost of production of potatoes per acre	Cost of production of potatoes per market-abel barrel produced
	$ c.	$ c.
Under 80	75 90	0 79
80— 99	77 05	0 70
100—119	76 00	0 69
120—139	76 37	0 68
140 and over	76 70	0 64
All farms	$76 37	$0 69

Location of Farm.—The area studied was divided into four crop districts representing slightly different types of soil and topography. Each district comprised two or more parishes. The division on this basis is indicated on the map of the area, shown on page 4. Crop district 1, includes the parishes of Drummond and Grand Falls and is settled chiefly by farmers of Danish and French descent. Crop district 2 includes the parishes of Lorne, Gordon, Perth, Kent and Andover; this area includes a large portion of land which is still under bush and is more rugged than the other districts. Crop district 3, includes the parishes of Wicklow, Peel and Wilmont; this district has the most cultivated land in the area studied. Crop district 4 includes the parishes of Wakefield, Brighton and Simonds; this is the area served by the towns of Woodstock and Hartland.

The total cost of production of potatoes per acre showed considerable variation between the four districts.

TABLE 82.—RELATION OF LOCATION TO COSTS OF PRODUCTION PER ACRE, 1934-35

Item	Crop district No. 1	Crop district No. 2	Crop district No. 3	Crop district No. 4	All farms
Number of farms	62	39	44	54	199
Barrels marketable potatoes	109	104	117	114	111
	$ c.	$ c.	$ c.	$ c.	$ c.
Seed	6 33	7 16	7·81	7 13	7 00
Fertilizer	17 05	22 31	24 94	20 63	20 53
Spray and dust	1 88	2 54	2 85	2 52	2 35
Man labour	18 08	21 68	17 85	17 11	18 51
Horse labour	8 02	7 61	8 54	8 46	8 15
Equipment	5 40	6 15	6 04	6 20	5 86
Buildings	2 87	2 37	2 20	2 11	2 46
Land	7 00	7 00	7 00	7 00	7 00
Other	3 60	4 25	3 91	6 73	4 51
Total all costs	$70 23	$81 07	$81 14	$77 89	$76 37
Cash costs	$23 41	$35 93	$41 20	$36 95	$34 50

The lowest average cost incurred was in crop district 1, or the area around Grand Falls and Salmonhurst. Almost all of the individual items making up the total cost were lowest in this area. Exceptions to this were the items of man labour and buildings. One of the most important savings was in the outlay for commercial fertilizer. Farmers of this district used more barnyard manure and practised a more definite rotation of crops.

There was little difference between the total costs in the other crop districts. Crop district 3, with the highest fertilizer cost was also the highest from the standpoint of total costs. Man labour costs were highest in crop district 2.

Cash costs per acre were materially lower in crop district 1, than in the other districts. Largely influenced by the high cost of commercial fertilizer, the cash costs were highest in crop district 3. The yield per acre, however, was also highest in crop district 3, exceeding that of crop district 1 by an average of 8·0 barrels per acre. This increased yield per acre would offset to some extent the increase in cost per acre.

The average financial summary of the farms of the different crop districts, shows considerable variation for the 1934-35 crop year. The farmers of crop district 4, suffered relatively the lowest losses per farm, due to the fact that expenses did not increase as much in this district as did farm receipts, in comparison with the other crop districts. It is probable that the fact that this district lies around the town of Woodstock led to somewhat higher receipts from live stock and live stock products than was the case in the other crop districts. The investment in live stock was considerably higher in this district than in the other areas. Comparison of the financial summary of the various crop districts is shown in Table 83.

TABLE 83.—RELATION OF LOCATION TO FINANCIAL SUMMARY, 1934-35

Item	Crop district No. 1	Crop district No. 2	Crop district No. 3	Crop district No. 4	All farms
	$	$	$	$	$
Farm receipts	752	990	961	1,335	1,003
Farm expenses	1,579	1,719	1,635	1,742	1,663
Farm income	−827	−729	−674	−407	−660
Interest	394	369	349	390	377
Labour income	−1,221	−1,098	−1,023	−797	−1,037
Farm products	272	331	267	252	277
Use of dwelling	141	132	155	162	143
Operators' earnings	−808	−635	−601	−383	−617

HIGH AND LOW INCOME FARMS

In order to compare some of the factors affecting farm income, the farms were sorted to secure the fifteen farms having the highest farm income and the fifteen farms having the lowest farm income. The results of this sort were similar to those found by sorting the farms by other methods. The farms which gave the more favourable results in 1934-35 were those having a low acreage of potatoes, and those which were relatively small in all respects.

The larger farms suffer the heaviest losses in years of unsatisfactory prices. The total receipts for each of the two groups of farms show a difference of only $90, while total expenditures were $2,408 higher on the farms showing the high losses. Some of the important factors which made up this large difference were: Labour, fertilizer, taxes, capital expenditures, depreciation, seed potatoes, and the operating costs of tractors, trucks and automobiles.

TABLE 84.—COMPARISON OF FACTORS INFLUENCING THE FARM INCOME ON FARMS SHOWING THE HIGHEST AND LOWEST INCOMES, 1934-35

Factor	Highest income 15 farms	Lowest income 15 farms	Factor	Highest income 15 farms	Lowest income 15 farms
Acres, potatoes	9	31	Live stock	429	423
Acres, oats	21	32	Miscellaneous	314	44
Acres, hay	38	46	Inventory increase	162	194
Acres, all crops	75	119			
Live stock (animal units)	10·7	12·2	Total receipts	$1,436	$1,526
Farm capital	$5,720	$13,860	Total expenses	1,158	3,566
Barrels marketable potatoes per acre	116	114	Farm income	278	−2,040
			Interest	285	693
Receipts—			Labour income	−7	−2,733
Potatoes	$217	$415	Operators' earnings	$375	$−2,175
Other crops	314	450			

Many of the costs of maintaining and operating a farm are of a semi-rigid nature and tend to remain fairly constant from year to year. These costs increase with the size of business and hence the larger farms find it impossible to reduce their costs by anything like the same extent that returns are reduced in years of low farm prices. In addition, it is usually very difficult to forecast the price of agricultural commodities sufficiently early in the year to adjust the production program to the price level. For this reason the larger farms usually incur fairly large expenditures before they know what price they are going to receive for their product. A comparison of some of the more important items of expense on the high and low farm income groups of farms is given in Table 85.

TABLE 85.—COMPARISON OF EXPENSE ITEMS ON FARMS SHOWING THE HIGHEST AND LOWEST FARM INCOMES, 1934-35

Expense item	Highest income 15 farms	Lowest income 15 farms	Expense item	Highest income 15 farms	Lowest income 15 farms
	$	$		$	$
Labour expense (ex-operator)	244	960	Tractor, truck and auto	72	218
Fertilizer expense	185	701	Seed potatoes	60	255
Capital expenditures	140	252	Other	255	733
Inventory decrease (depreciation)	154	356	Total expenses	$1,158	$3,566
Taxes	48	91			

A similar analysis made of the records covering the crop year 1935-36 showed a somewhat different picture than the analysis of the previous year's records. The size of business for the two groups of farms in 1935-36 did not show any decided differences. The group showing the most satisfactory returns had slightly higher acreages of potatoes, acres of crop land and numbers of cattle. The most significant difference was in returns from potatoes. Yield per acre of potatoes was considerably higher on the high income farms and the price received for the potatoes sold was also higher. This resulted in an average return of $120 per acre from potatoes on the high income farms compared with an average return of $76 per acre for the other group. Both groups reduced their acreage of potatoes by approximately 30 per cent from the previous year.

TABLE 86.—COMPARISON OF FACTORS INFLUENCING THE FARM INCOME ON FARMS SHOWING THE HIGHEST AND LOWEST INCOMES, 1935-36

Factor	Highest income 15 farms	Lowest income 15 farms	Factor	Highest income 15 farms	Lowest income 15 farms
Acres, potatoes	11·7	10·4	Other crops	237	144
Acres, oats	26·7	27·9	Live stock	416	342
Acres, hay	43·9	42·3	Miscellaneous	66	75
Acres, all crops	87·8	86·3	Inventory increase	83	52
Live stock (animal units)	13·4	12·1			
Farm capital	$7,658	$9,911	Total receipts	$2,216	$1,410
Barrels marketable potatoes per acre	86·4	62·9	Total expenses	1,298	1,906
Price received per barrel	$1 39	$1 21	Farm income	918	−496
Returns per acre, potatoes	$120 00	$76 11	Interest on capital	386	498
			Labour income	532	−994
Receipts—			Operators' earnings	961	−510
Potatoes	$1,414	$797			

The farms of the high income group had in 1935-36 total receipts averaging $2,216 or $715 above the average, and total expenses averaged $31 below the average of all farms. The farms of the low income group had total receipts averaging $91 below and total expenses averaging $577 above the average of all farms. Checking the financial results of these farms in the previous year it was shown that the farms making the most satisfactory returns in 1935-36 had also done better in 1934-35 than had the other group of farms.

With size of business approximately the same for the two groups of farms, it would appear that the lower costs on the high income group were due to greater efficiency of production. These reduced costs were largely in connection with labour and fertilizer, although almost all items of expense show lower expenditures. The high income group (low costs) had low costs in both years of the study and showed a reduction of $260 per farm in current farm expenses in the second year. The low income group reduced their current expenditures by $272 per farm, but increased their returns by only $7 per farm, compared with an increase of $523 per farm for the high incomes group.

TABLE 87.—COMPARISON OF EXPENSE ITEMS ON FARMS SHOWING THE HIGHEST AND LOWEST FARM INCOMES, 1935-36

Expense item	Highest income 15 farms	Lowest income 15 farms	Expense item	Highest income 15 farms	Lowest income 15 farms
	$	$		$	$
Labour expenses (ex-operator)	352	548	Taxes	53	78
Fertilizer	180	260	Seed potatoes	22	46
Capital expenditures	119	139	Other	402	522
Inventory decrease (depreciation)	170	313	Total expenses	$1,298	$1,906

SUMMARY

The economic conditions prevailing during 1934-35, the first year's farm business studied, were decidedly unfavourable. Potato prices were particularly low and a large portion of the crop never reached a market. Receipts from potatoes during 1934 were only a small percentage of total farm receipts. Economic conditions, and especially the farm price of potatoes, were materially improved during 1935-36. Additional records covering this second year show considerably higher returns from the potato crop and consequently a much-improved financial statement for the farms as a whole.

The average acreage of potatoes grown in New Brunswick for the period 1926-1935 was 48,906 acres. There was a slight tendency to increase acreage over this ten-year period. The combined counties of Carleton and Victoria reported in the 1931 census a greater average acreage of potatoes per farm than any other county in Canada.

Hay and oats are the chief crops grown in the area from the standpoint of acreage. Potatoes are the major crop grown for market. The average acreage of potatoes grown by those included in the 1934-35 study was 13·8 acres. Those farmers included in the two-year study grew an average of 8·8 acres of potatoes in 1935-36. The average yield of potatoes harvested in this province from 1926-1935 was 111·5 hundredweight per acre, compared with the Dominion average of 81·8 hundredweight.

The average investment in farm capital for those farmers included in the study was $7,618. Real estate was valued at $5,628 per farm; live stock at $840; equipment at $1,070. A study of the accuracy of the estimates of land values indicates a close relationship between the farmers' estimates of land values per acre and the yield per acre harvested on individual farms.

Live stock production was not an enterprise of major importance on the farms included in the study. Horses provided almost all the farm power. An average of 11·6 head of cattle was maintained on these farms. Numbers of swine, sheep and poultry kept on farms were relatively small.

Farm receipts for the year 1934-35 were low, due in most part to the low returns from potatoes. Crop sales and sale of live stock and live stock products were the chief sources of revenue on these farms. In 1935-36, farm receipts were improved by 56·4 per cent. Income from the potato crop showed an average increase of $679 per farm and in that year provided almost 60 per cent of the total farm income.

The farm makes a liberal contribution to the living of these New Brunswick farm families. Farm products consumed in the home had an average estimated value of $277 per farm. This factor is of especial importance in years of low receipts.

Operating expenses per farm were reasonably low, but the use of a relatively large quantity of commercial fertilizer and the necessity of hiring additional labour for potatoes increased cash expenditures. Capital expenditures were very low for the first year under review. Similar conditions maintained throughout 1935-36, with a general reduction of $278 per farm in farm expenses. Most of this reduction was associated with the reduction in potato acreage.

At least some hired labour was used by 191 of the 199 farmers included in the study. Day labour during the rush seasons of seeding, haying and potato digging was the most frequent type of labour hired. Family labour in addition to that of the operator was available on 122 of the farms. The distribution of labour over the year was unbalanced in that the bulk of the work occurred during the summer months.

Farm indebtedness was not high in the area compared with other farming areas of Canada. Indebtedness was reported by 124 of the 199 farmers visited. The average debt per farm was $994, of which 71 per cent was in the form of mortgage.

The farm income and labour income of the farmers of the area during 1934-35 was very low. In almost all cases receipts were not sufficient to cover total expenses, not including interest on investment. The losses were greater on the larger farms, which would be expected in such a year of low income. During 1935-36, however, farm income was improved by an average of $819 per farm. In this year the farms operated on the largest scale were the most successful financially.

The cost of producing an acre of potatoes, including growing, harvesting and storage, averaged $76.37 for 1934-35. Costs of marketing were not calculated as only a small portion of the crop was marketed. The most important items of cost were fertilizer, man labour, horse labour, spray materials, machinery use, land and building use. Cash costs amounted to $34.50 per acre. For the 70 farms included in the 1935-36 study the average cost of production was $82.20 per farm, the increase in average cost per acre over the previous year was largely associated with the general reduction in acreage.

There was considerable variation from the average cost per acre reported above, but 56 of the 199 farms reported costs of from $70 to $80 per acre. There were 10 farmers who reported the cost of production of potatoes below $60 per acre, while 16 farmers showed costs in excess of $100 per acre.

The average gross return per acre of potatoes from 1926-1935 for the province of New Brunswick was $78.63. Returns per acre varied from a high of $188.10 in 1926 to a low of $26.75 in 1931.

Almost all of the individual items of cost tended to be increased on the higher cost farms, but the two most important factors influencing total costs were those of labour and fertilizer. Low costs of production per acre were also associated with low yields per acre.

The cost of production per acre of potatoes declined as the number of acres of potatoes increased up to approximately 18 acres. After this point the cost per acre tended to increase. The cost per acre for labour and equipment tended to decline as the number of acres of potatoes increased. The farm income secured in 1934-35 by farmers of the area declined sharply as the acreage of potatoes increased; in 1935-36 the reverse was true and farm income rose with the acreage of potatoes.

The degree of specialization in potatoes, as measured by percentage of productive-man-work-units devoted to potatoes, did not show any significant changes in the cost of production of potatoes per acre. Farm income for 1934-35 declined as the degree of specialization became greater; in 1935-36, when the average farm income was more than zero, the income increased with greater specialization.

The total cost of production per acre of potatoes shows considerable variation between various sections of the area. The lowest average costs per acre were reported in the area around Grand Falls and Salmonhurst. This area was settled chiefly by Danish and French farmers. The highest cost per acre was reported in the area around the town of Centreville.

APPENDIX

Definitions

Farm Income.—Is the amount remaining after total farm expenses including an allowance for unpaid family labour and depreciation on buildings and equipment, but *not including interest nor allowance for operator's labour,* have been deducted from total farm receipts.

Labour Income.—Is the amount remaining after interest on the total farm investment (calculated at 5 per cent in this survey) has been deducted from farm income, and represents the return to the operator for his labour and management; in addition he receives food, fuel and housing derived from the farm.

Operators' Earnings.—Is the amount the farmer receives after deducting all costs including interest and after taking into consideration the value of farm products used in the home and the value for the use of the farm home.

Cost of Producing Potatoes.—In the calculation of cost of producing potatoes in this study, the cost does not include the marketing of the crops, because such information was not available for the 1934 crop. All indirect costs such as interest, depreciation and unpaid family labour have been included.

Productive-Man-Work-Units.—The total productive-man-work-units of a farm is the amount of directly productive work accomplished on that farm in a year. This is figured on a basis of the average amount of man labour required to take care of an acre of the various kinds of crops and the different kinds of live stock. For example, it takes an average of 30 hours of man labour to produce an acre of oats, so each acre of oats represents three productive-man-work-units based on a ten hour day. It takes an average of 150 hours per year to care for a grade cow, so each grade cow in the herd is counted as 15 productive-man-work-units.

BASIS FOR COMPUTING ENTERPRISE COSTS

Man Labour.—The rate charged per hour of man labour was based on the total productive-man-work-units used per farm. The total cost of labour per farm including an estimated value of the operator's time was divided by the total productive-man-work-units in order to calculate the rate per hour of man labour. The charge to potatoes was determined by charging the hours of man labour devoted to potatoes by the rate per hour calculated as above.

Horse Labour.—The rate charged per hour of horse labour was calculated on a similar basis to that of man labour. The total cost of feeding, housing, interest, depreciation, shoeing and veterinary work, less appreciation, was divided by the total productive-horse-work-units used on the farm.

Land Use.—Farmers of the area were asked to estimate the rental value of the land used for potato production. The practice of the townsfolk renting land for the production of potatoes is followed to some extent in the area. The average rental value estimated by the farmers was $7 per acre. This figure closely approximates the cost that would have resulted from using an interest charge on the value of the land plus taxes.

Interest.—Interest was charged at 5 per cent per annum. Interest on cash growing costs was charged for six months.

Storage.—The charge for commercial storage of potatoes was made according to the amount paid by the individual farmers. Storage provided on the farms was charged on the total capacity of the available storage. On special potato houses the rate was 3 cents per barrel and for cellars under the house or barn, the rate was 1 cent per barrel.

Depreciation.—In the case of special potato equipment, the rate of depreciation was 7 per cent plus repairs, based on an average life of fifteen years. On other general farm equipment, the rate of depreciation was 10 per cent less repairs.

The rate of depreciation charged against automobiles was varied according to the years during which the machine had been in operation. Automobiles in use two years and under the rate was 20 per cent, machines in use from three to five years were charged at 15 per cent and autos used more than six years were charged at 10 per cent. Trucks were charged at 15 per cent and tractors at 10 per cent depreciation.

In connection with depreciation on buildings, the year-end value was secured from the individual farmers. The value of buildings at the beginning of the year was calculated by multiplying the year-end value by 1·042 in the case of frame buildings and by 1·02 in the case of brick or stone buildings, minus repairs and new buildings. This is the equivalent of a rate of 4 per cent on the frame buildings and 2 per cent on the brick and stone buildings.

Machinery.—The charge for machinery to potatoes was divided under the headings of special equipment and general equipment. In the case of special potato equipment, the charge to potatoes was made after calculating depreciation, interest and repairs on this type of machinery. The charge for general equipment was based on the total annual charge for this equipment divided by the total acres of crop and the potatoes charged on the basis of acres of potatoes as a percentage of total crop acres.

Auto Use.—The cost per hour of operating the automobile used on the farm was calculated by totalling all costs of operation, as well as interest and depreciation on the automobile, and dividing this total by the total miles operated during the year. The charge to potatoes was made on the basis of the farmer's estimate of the miles of auto use devoted to potatoes. A similar method was used in the calculation of the charge for truck use.

Fertilizer.—Where commercial fertilizer was used on the potato land, the entire cost was charged to the potato crop based on the fact that the potato crop is a specialized one and other crops in the rotation are simply incidental to potato production. In cases where barnyard manure was used for fertilization of the potato crop, the potato crop was charged with the man and horse labour used in putting on the manure, but no charge was made for the fertilizer itself. Barnyard manure has no definite market value in this area and it was impossible to calculate the residual effect of such fertilization. By charging the entire labour costs, it was considered that a fair share of the cost had been charged to the potato crop. Applications of barnyard manure were generally light. Lime was not used for the potato crop and when applied on any farm, no charge was made against the potato crop.

Seed.—Potato seed which was purchased was charged at the price paid by the producer. Home-grown seed was charged at the average purchase price which in 1934 was $1.25 per barrel for certified seed and $0.90 for uncertified seed.

Spray Materials.—Spray materials were charged at the prices paid by the producers for their supply of the various ingredients.

Farm Supplies.—Supplies of grain and hay on hand were valued at the average of the farmer's estimate of their value; oats at 40 cents per bushel; wheat at 90 cents per bushel and hay at $8 per ton.

Farm Products.—The values placed on farm products consumed in the home were calculated at farm prices.

Animal Units.—The following standard was used for the calculation of animal units:

TABLE A.—CALCULATION OF ANIMAL UNITS

Item	Animal units	Item	Animal units
Horses	1·0	Calves	0·5
Stallions	1·0	Boars	0·2
Colts	0·5	Sows	0·2
Cows	1·0	Other hogs	0·1
Bulls	1·0	Sheep	0·14
Heifers	0·5	Lamb	0·07
Steers	0·5	Hens (per 100)	1·00
Yearlings	0·5	Foxes	0·50

Productive-work-units.—The standard use for calculation of productive-man-work-units and productive-horse-work-units was as follows:—

TABLE B.—LABOUR STANDARD

Item	Productive-man-work-units, per acre	Productive-horse-work-units, per acre	Item	Productive-man-work-units, per animal	Productive-horse-work-units, per animal
Small grains	3·0	3·0	Hens (per 100)	30·0	1·0
Hay	1·0	1·0	Chicks	0·5	—
Roots	17·0	7·0	Foxes	1·0	—
Corn	6·0	3·0			
	Per animal	Per animal	*Outside labour*—		
			Man and team, per $4.00 receipts	1·0	2·0
Cows	15·0	1·0	Threshing, per $15.00 receipts	1·0	—
Young cattle	3·0	1·0	Lumber, per M feet	2·0	2·0
Colts	3·0	1·0	Pulp and wood, per cord	1·0	1·0
Sows	3·0	1·0	Man labour, per $2.00 receipts	1·0	—
Other hogs	1·0	1·0			
Ewes	1·0	1·0			
Lambs	0·5	1·0			

Crop Index.—The crop index used in this study was based on yields per acre of oats and hay secured by the individual farmers, compared with the average for all farmers in the study.

Live Stock Index.—The live stock index was measured by calculating the net returns from live stock after deducting live stock purchases. This return was worked out as an average return per animal unit and then compared with the average for all farmers in the study.

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1937